

The Iron Age

A Review of the Hardware and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 10 Warren Street, New York.

Vol. XI: No. 15.

New York, Thursday, April 10, 1873.

Four Dollars a Year.
Single Copies, Ten cents.

The Refining of Iron in the English Finery.

The refining of iron is an intermediate process, between smelting the ore in the blast furnace and the forging the metal, for the purpose of removing certain impurities before its removal to the charcoal forge or to the puddling furnace. This operation is best carried out by the English method, in which a hearth is used formed of hollow cast iron plates, through which a current of cold water is constantly running to prevent their melting. This hearth is provided with from two to six tuyeres, which furnish a strong current of blast. The pig iron is melted either with or without the addition of coke or charcoal, and then subjected for some time to the action of the blast. By the latter, as well as by the oxide of iron produced, it is purified, and as soon as it has become less fluid, it is tapped off. The hearth is then immediately charged again. As the blast serves less for the production of a high temperature than for oxidation, it is seldom applied hot. In some places steam has been used with the blast, or the blast has been directed through the molten pigs. Indeed, this latter method may be considered as the forerunner of the Bessemer process.

The finery was originally used to improve the impure pig contaminated with silicon, before puddling, but later it was also introduced in combination with the fining in the charcoal hearth in South Wales, Styria and other places. The refined metal produced from gray coke pig is generally porous, owing rather to the fact that a current of water is permitted to flow upon it as soon as it becomes solid, than to a lesser amount of carbon. By the fining the percentage of the carbon in the iron remains generally the same, or varies but little, but the graphite is converted into chemically combined carbon, while a good deal of the silicon, manganese, and phosphorus pass into the slag. The slags are mostly dark colored, vitreous or crystalline, and consist mostly of a singulo-silicate of protoxide of iron. Their composition has been ascertained by the following analysis:

	1.	2.	3.	4.	5.
Silica	25.77	33.33	22.76	13.69	20.1
Protoxide of iron	65.53	54.94	61.28	73.22	23.8
Peroxide of iron				13.97	6.9
Manganese	1.57	2.71	3.53		40.7
Alumina	3.60	5.75	7.30		2.3
Lime	0.45	1.19	3.41		7.8
Magnesia	1.28	0.50	0.76		
Sulphur	0.23		0.46		
Sulphide of iron		0.27			
(FeS)		0.27			
Phosphorus	1.37	0.39			
Copper		traces			

1. Fine metal slag of Dowlais—RILEY. 2. Crystallized slag of Dowlais—RILEY. 3. Crystallized like olivin from the Bramford Iron Works—FORBES. 4. Crystallized slag of Stourbridge—RAMMELSBURG. 5. Crystallized of Jan-
enberg, in Carinthia—HARDT.

In Figs. 1 and 2 we represent a finery with two tuyeres and heating fire as erected in Mariassell, in Styria. A is a hearth with closed sides, except at the working side. The bottom consists of fire-proof stones, upon which a layer of quartz sand is spread. Three sides are closed with hollow cast iron plates cooled with water, viz.: the tuyere-plate *b*, the blast-plate *c* and the back-plate *d*; the fourth, or working side, is formed by the tap-stone *f*, with the tap-hole *g*, for drawing off the refined iron and the slag. *h*, *i*, *k*, are cast iron fire plates, screwed to the cast iron supports *m*. The latter, as well as the hooped side-plates *n*, serve to support and fasten the wall of: *p*, *p*, are copper tuyeres with a dip of 15 degrees and protruding six inches. They have a width of 1½ inches, and are 1½ inches in height. In order to utilize all the heat, the flame is made to pass from the finery-hearth to a heating-hearth, of which part *B* serves for heating the pig, while the back part *C* serves for glowing the wrought iron bars (slag iron), which is to be further worked under the flat hammer. *D* is the chimney and *S* a damper. Both parts of the heating furnace are provided with doors for charging and discharging. *E* is a pig which can be introduced on a wheel through a hole in the blast-plate. In a hearth of 32 inches width, 36 inches length and from 9 to 10 inches depth from the tuyere to the sand bottom, 10 cwt. of fine iron are produced every three hours, with a supply of from 4 to 6 cubic feet charcoal per 100 lbs. The waste of iron consists of from 3 to 9 per cent., in proportion as it has been equalized with a greater or lesser addition of finery slag; the pressure of the blast is 18 inches water column. The fine iron is tapped off into a pit lined with sand or charcoal dust, or, better, into cast iron molds previously washed with a thin clay solution, to prevent adhesion of the refined iron to its surface.

Figs. 3 and 4 represent a finery of larger dimensions, with six tuyeres. A is the bottom, consisting either of sand or slag, and resting on a platform, *B*, of fire-proof bricks. The back plate, *C*, and the two side plates, *D*, of the square hearth are formed of hollow cast iron plates, through which a current of water is running. *E* is the front plate, with the tapping hole, *O*, out of which the molten metal runs

into the cast iron chill mold, *F*. *G* is the working plate. *a*, *a* are side plates, with grooves for rod, *S*, which serves as support for the crowbar in working the metal. *H*, *H* are plates, with the tuyere openings. *I*, *I* are side plates of the hearth, fastened to the columns, *K*. The latter, as well as beams, *L*, *L*, support the chimney, *M*. *W*, *W* are blast pipes, with the valves, *V*. *b*, *b* are water tuyeres, with nozzles of a dip of from 25 to 30 degrees. *r*, *r* are water boxes, which provide the tuyeres, as well as the three hollow hearth walls, with water, which runs

experience, the temper can be restored at this point, by applying water while the blade is yet hot, a plan that is now commonly practiced.

Joining saw blades, however, belongs to the saw maker, and the necessity for doing it in the workshops is owing to the frequency of breaking the blades, which will no doubt be overcome in time.

To make a joint with silver solder or German silver, the solder should be rolled into thin sheets; the saw being scarfed or bevelled off to about one-third of its thickness at the ends,

above the earth, and eight feet apart, sawed off at the top and made even and true; they will then have bolted to them a good solid timber 12 inches square. On the top of this will then be bolted a heavy five inch rail in the shape of inverted U. The roadway is now complete. The cars were 15 feet wide and two stories high. Much of the first story is in two parts, hanging on the rail like panniers on a mule's back. All the cars, including the locomotive, are thus constructed, and are there suspended on this great central rail—no part touching earth. To

course of the boiler was stayed only by a stone embankment built against the street and below its level.

As an illustration of the force with which it was thrown, it must have gone nearly on a level from its first altitude as it passed under the telegraph wires on Nutt street, and but for the embankment under the house on Front street would probably have continued its course for 300 ft. further. Front street is about on a level with the top of the mill. This boiler must have passed broadside through the air until it reached a row of shade trees in the yard of the Front street premises, when resistance offered by them turned its course, and it entered the basement of the house lengthways; otherwise the entire house would have been demolished and the accident would have been still more fearful in its results. The steam cylinder, which passed from the boiler room to the engine, was torn in half, one part falling in the dock to the north of the mill, the other passing through the mill, shattering everything as it went, and falling on the wharf beyond it. The casualties amount to three persons killed outright, one probably mortally wounded, two seriously wounded and several others more or less injured. The boilers weighed 7000 pounds each. They were 35 ft. long and 3 ft. in diameter, and had been in use at the mill about one year. They were among the newest and best equipped boilers in the city, and were generally worked under a pressure of 80 pounds of steam. The engine was stopped on Tuesday night as usual, and was started again at six o'clock this morning with the usual pressure, about 1000 ft. of lumber having been sawed previously to the explosion. The boilers were fastened very securely in their position in the boiler room, clamped down to an iron bed and placed as solidly as it was possible for them to be. The power of the fastenings was estimated at 40,000 pounds. The boiler room was of brick, 7 ft. high, the walls being 3 ft. thick, the whole secured with iron bands.

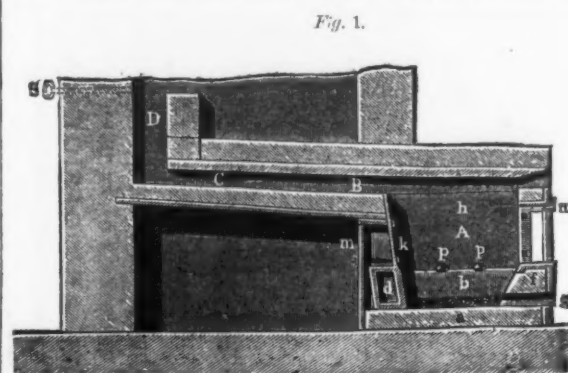


Fig. 1.

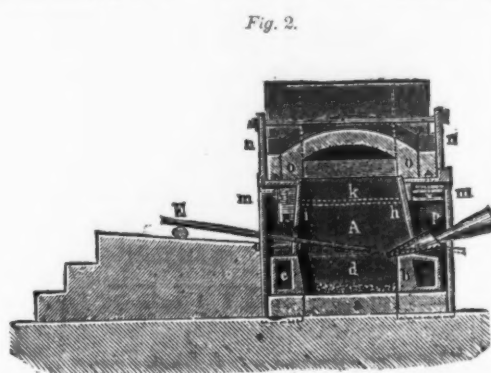


Fig. 2.

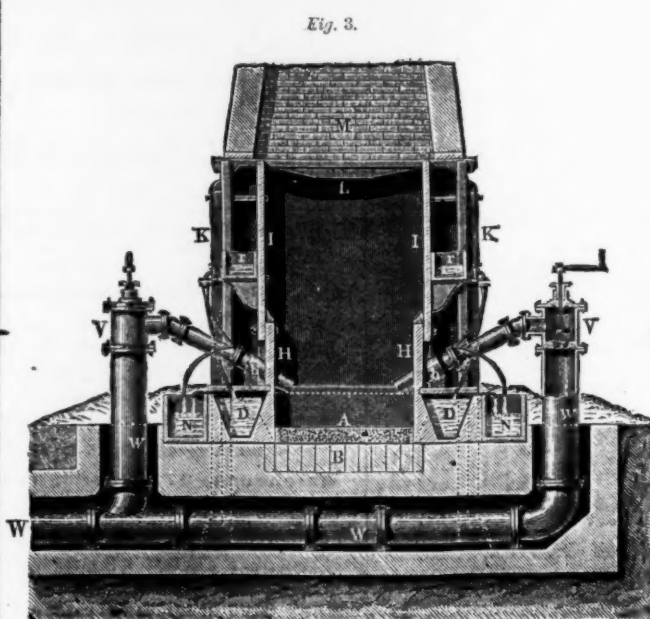


Fig. 3.

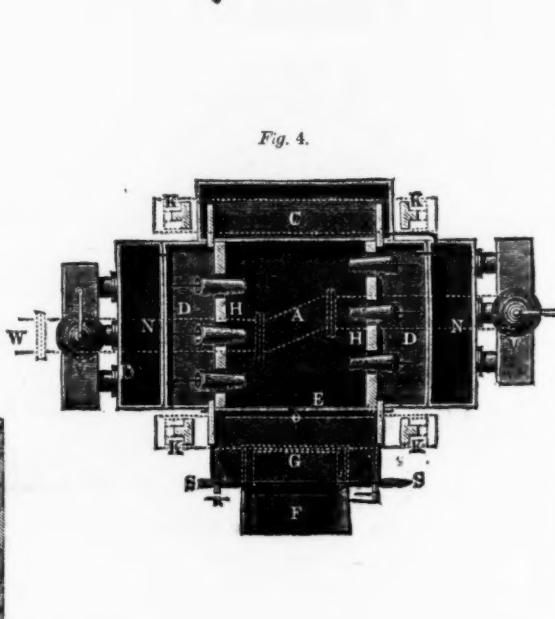


Fig. 4.

FINERY FURNACES—WITH TWO AND SIX TUYERES.

into the trough, *N*, in which the tools of the smelter are also cooled off.

A finery of this kind is charged with from 30 to 40 cwt. pig. Such a charge requires from 1½ to 2 hours for melting, and one-half hour for the action of the blast. The waste in iron consists of from 8 to 15 per cent.; the amount of coke required is from 35 to 50 lbs. per 100 lbs. fine iron, according to the purity of the pig, the quality of the coke and the time used. Smaller fineries, with two or three tuyeres, require per minute almost 600 cubic feet air; larger ones, with four or eight tuyeres, 1300 cubic feet, of from 1½ to 2½ lbs. pressure on the square inch.

In order to save fuel, attempts have been made to convey the liquid pig from the high furnace, or the cupola, directly into the finery. In the Morfa Tin Plate Works, at Llanelly (Glamorganshire), the iron obtained in a finery with two tuyeres and supplied with coke is permitted to run directly into two charcoal hearths, in which it is further treated.

Joining Band Saws.

In Richard's treatise on wood working machinery we find the following:

The operation of joining band saw blades, that at first seems so mysterious to those unused to brazing and soldering, is extremely simple when once learned. A few failures may be expected in the first experiments, and the letters received by the manufacturers of sawing machinery from their customers relating to this matter are sometimes quite humorous, and not unfrequently contain practical suggestions of great value that have been overlooked in the workshop by the builders.

Brass, spelter, German silver, and various alloys are used for making the joints; the preference being generally in the end given to the silver solder, on account of its convenience and the low heat at which it fuses, compared with brass. Its strength is quite sufficient, although not equal to brass; in fact, the joints, however made, rarely give way, the weak points being where the annealed or soft steel meets the tempered, or unannealed portion of the blade: by a little dexterity, however, and after some

and cleaned with acid; the solder is placed in the joints, the piece being large enough to project on all sides; the joints should then be clasped with a heavy pair of tongs, heated to a full red heat, and held until the solder is well melted and runs out of the joint, when the tongs can either be suddenly cooled with water, or removed, as the case may be. For heavy saws of four inches or wider, there should be provided two pairs of tongs, the heated pair is clasped over the hot pair from the opposite side, and give the compression needed to close the joint.

The manufacture of band saw blades requires the most careful and intelligent manipulation, with a great deal of what may be termed special knowledge; so much so, that their manufacture has become quite exclusive things in Paris, where they are nearly all made at this time. The steel for the larger plates, and indeed for the greater number of saws, is made now in England, but the tempering and smithing processes remain with the French.

Saw makers sometimes contract with French houses for steel, tempered and ready for tooling and grinding processes that can certainly be as well done, and much cheaper in France; the object being to secure the name of manufacturing band saws. This plan is likely to lead to doubtful results, owing to the great danger of drawing or injuring the temper by those who do not understand the entire process.

Perin Company, of Paris, were the first to manufacture the blades that gave profitable results; being also the manufacturers of machines, and indeed for a long time the only manufacturers of such machines. Their experience in operating the saws, combined with great care and perfection in their manufacture, have rendered Perin's blades famous all over the world.

A New Plan for Single Rail Railways.

—Mr. W. K. Reynolds, of St. John, N. B., proposes a plan of railway construction which has the merit of novelty, at least. He proposes a series of posts or timbers firmly set in the ground by a pile-driver or some means that will insure their permanence and exact vertical position. These will be some seven or eight feet

prevent oscillation there is on each side of the posts a continuous rail or bar, and on the parts of the cars most likely to come in contact with the posts are a series of rollers that will act as fenders. It seems, however, to be the purpose of the inventor to have the cars and locomotive so evenly balanced, and their weight so much greater below the center of the wheels than above, that the whole train will hang steadily upon the rail.

The Wilmington Boiler Explosion.

A communication from Wilmington, N. C., under date of April 2d, gives the following account of the recent boiler explosion in that city:

At fifteen minutes to seven o'clock a terrible explosion was heard and felt all through the city, and it soon became known that the boilers at Messrs. Colville & Company's steam saw-mill, at the foot of Walnut street, had exploded. About two-thirds of the mill building lay crushed and out of shape. The engine was broken, while the boiler house was laid level with the ground. To the north of the spot where the house stood, and about 30 ft. distant, resting on a pile of lumber and elevated at an angle of about 30° was found the boiler that was nearest the pump. It is uninjured, with the exception of a hole about 6 or 8 in. in diameter. The second of the three boilers, being that which was in the center, was found lying in Colville & Co.'s enclosure, and against the fence that divided it from Nutt street. It had been carried a distance of about 200 ft., all except one end, which had taken an opposite direction, passing through the mill, which it shattered, and falling in the river beyond it. The third boiler, which was farthest from the pump and next to the chimney, was taken up and carried through the air a distance of about 450 ft., taking off the top of one house and the chimney of another on Nutt street, tearing fences, outhouses and trees, and finally landing in the basement of the building on Front street, occupied above by James Meir and George Williams, and below by two colored families. The basement of this building was guarded by a solid brick wall on the side facing to the mill, but this was crushed like an egg shell, and the

Telegraphic Consolidation.—The announcement that the Anglo-American Telegraph Co., the Societe du Cable Transatlantique, and the New York, Newfoundland and London Telegraph Company had agreed upon a consolidation has been received with anything but satisfaction by the business community of this country. The Anglo-American Company was formed in 1865, with a capital of £600,000, with a view to completing and laying the first Atlantic Cable, after several unsuccessful attempts had been made by the original company. Its lines extend from Valencia, Ireland, to Heart's Content, Newfoundland. The French Company was organized with £1,200,000 capital, and its wires extend from Brest, France, to Duxbury, Mass., via the Island of St. Pierre, a distance of about 3100 miles. The New York, Newfoundland and London Company, of which Cyrus W. Field is president, has wires from Heart's Content, Newfoundland, to Port Hastings, Cape Breton Island. This company was chartered with a capital of \$4,000,000, and has the exclusive right to land cables on the Newfoundland shores. The amalgamation of these companies is accounted for in some quarters on the ground of economy in their service and management. In other circles the movement is regarded as the inception of a monopoly. Two new cables are in course of construction, one of which is the American Cable Telegraph Company, from a point on the coast of Great Britain to Rye Beach, New Hampshire. This Company is prohibited by its charter from amalgamating with any other. The other company will have lines extending from Lisbon, Portugal, to some point on this coast.

A New Mitrailleuse.—An enterprising Tennessean has invented a mitrailleuse, now being tried at Sand's Point, on the Sound, which scatters its fire over a larger area than the French gun, and is not so likely to soon become heated as that weapon. It has twenty-four barrels of forty-four calibre grouped together in a chamber of brass in such a way that at a distance of 300 yards their contents are thrown over an ellipse the long diameter of which is 24 feet, the size of the ellipse increasing proportionately to the increase of distance. The brass receptacle is filled with water, which effectually prevents the too great heating of the barrels, and the entire 24 barrels are discharged by a lever, which also, by a simple combination in one compound movement, revolves the chambers, throws out the discharged cartridges, and replaces them with new ones. In a trial held at Sand's Point recently, it discharged 1200 shots in one minute, completely riddling a target 12 feet by 6 placed at a distance of 100 yards. The gun, together with one on a more simple pattern, is to be exhibited at the Vienna Exposition.

The workmen engaged in digging the Oswego and Tualatin Canal, Oregon, recently, discovered a good quality of iron ore. The vein appears to be extensive.

Metals.**ANSONIA
BRASS & COPPER CO**
19 and 21 Cliff Street
(Adjoining Office of Phelps, Dodge & Co.)

Sheet Brass, Sheet Copper,
Planished Brass, Planished Copper,
Meyer's Patent, Copper Rivets & Burs,
Brass Seamless Scoops, Braziers' Bolt Copper
Brass Wire, Braziers' Rivets,
Hayden's Patent Brass Copper Tubing,
Kettles, Copper Bottoms,
Brass Tubing, Copper Wire,
Lamp Burners, Iron Wire,
Saw Burners, Fence Wire.

A large variety of Wood and Bronze Case
Clocks.

MANUFACTURERS AT ANSONIA, CONN.

Phelps, Dodge & Co.,
IMPORTERS OF

TIN PLATE,
Sheet Iron, Copper, Pig Tin
Wire, Zinc, etc.

MANUFACTURERS OF

COPPER and BRASS.
Cliff St., bet. John and Fulton,
NEW YORK.

T. B. CODDINGTON & CO.,
25 & 27 Cliff St., New York.

Importers of

TIN PLATES,
And METALS of all descriptions.

A. A. THOMSON & CO.,
Importers and Dealers in

**Tin Plate, Sheet Iron,
ZINC, COPPER, WIRE,
Block Tin, Spelter, Solder, &c.**

Nos. 213 and 215 Water and 119 Beekman St.
NEW YORK.

P. O. Box, 61.

SCOVILL MFG. CO.

No. 4 Beekman St., NEW YORK,

MANUFACTURERS OF

SHEET AND ROLL BRASS,
BRASS AND COPPER WIRE,
GERMAN SILVER,
BRASS BUTT HINGES,
METAL LAMPS AND TRIMMINGS,
LOCAL OIL BURNERS,
METAL BLANKS CUT TO ORDER,
CLOTH AND METAL BUTTONS, in every variety.

PHOTOGRAPHIC GOODS.

Jerome's Celebrated Clocks.
AGENCIES:

4 Beekman Street, New York,
131 Federal Street, Boston,
105 Randolph Street, Chicago.

MANUFACTORY:

WATERBURY, CONN.

Lead Pipe and Sheet Lead,
Improved

Tin Lined Lead Pipe,
Block Tin Pipe, Bar Tin, Pig Tin,
Pig Lead, Solder, &c.

The Colwells, Shaw & Willard Mfg. Co.
No. 213 Centre Street, New York.

EVANS & ASKIN

BIRMINGHAM, ENGLAND,

Refiners of Nickel and Cobalt.
SOLE AGENTS,

VAN WART & McCOY,
43 Chambers St., New York.
Nickel and Cobalt always in stock.

Augustus Belknap, Jr.
Metal Broker,

**Tin Plate, Block Tin,
Spelter,
Iron Copper, etc.**

60 Beekman Street, New York.
Hardware Orders attended to.

Metals.

Wallace & Sons,
Manufacturers of
**Brass and Copper Wire,
SHEET BRASS,
Copper Rivets & Burs,
BRASS & IRON JACK CHAIN,
Braziers' Bolt & Sheathing Copper,
Stair Rods, Copper Tacks and Nails,
Brass Butts, &c., &c.**
89 Chambers and 71 Reade Sts.,
NEW YORK.
MILLS, ANSONIA, CONN.



Waterbury Brass Co.
JOHN SHERMAN, Agent,
No. 52 Beekman Street, NEW YORK.
Mills at WATERBURY, CONN.
Sheet, Rolled and Platers' Brass,
GERMAN SILVER,
Copper, Brass and German Silver Wire,
BRASS AND COPPER TUBING,
COPPER RIVETS AND BURS,
BRASS KETTLES,
WASH BASINS,
Door Rail, Brass Tags & Step Plates.

BENEDICT & BURNHAM MFG. CO.

MANUFACTURERS OF

Rolled and Sheet Brass and German
Silver, Brass, Copper and German
Silver Wire, and Beading.
Plain and Fancy Tubing, Brass and Copper
Rivets and Burs, Brass and German Silver
Castings, Piano-Forte and Wrought Brass
Butt Hinges, Coal Oil Burners, Lamps and
Lamp Trimmings of every description, Patent
Lamp Scissors, &c., &c.
Depots—78 Reade St., N. Y., 68 Federal St.,
Boston, and 17 N. Seventh St., Philadelphia.
Capital \$400,000.
Aaron Benedict, Pres.
Chas. Benedict, Treas.
Chas. Dickinson, Secy.

BROOKLYN

BRASS & COPPER CO.,
JOHN DAVOL, Prest.,

No. 100 John Street, NEW YORK.
Sheet Brass, Copper Sheets,
Roll Brass, Copper Segments,
German Silver, Copper Circles,
Brass Tubing, Copper Bolts,
Ger. Silver Tubing, Copper Wire,
Brass Wire, Copper Rivets & Burs,
Ger. Silver Wire, Copper Sheathing,
Brass Door Rail, Copper Bottoms,
Brass Rivets & Burs, Copper Tube,
Braziers' Solder.

MILLS, BROOKLYN, L. I.

Chas. J. Pope & Bro.
292 Pearl Street, New York,

Furnace Agents for Anthracite,
Charcoal and Sootch

PIG IRON,
COPPER, SPELTER,
TIN, LEAD, NICKEL, BISMUTH, &c.

U. O. CRANE.

BROKER IN

PIG IRON & METALS,
104 John St. New York.

Mosselman Zinc.

Assorted widths and numbers, by cast or sheet, in
store, at lowest rate.

A. A. THOMSON & CO.,
Box No. 61.
213 and 215 Water Street, N. Y.

SOLDER.

For Sale at lowest market rates, by
A. A. THOMSON & CO.,
Box 61.
213 & 215 Water Street, N. Y.

Metals.

**The Plume & Atwood
Mfg. Company,**

MANUFACTURERS OF

SHEET and ROLL BRASS and WIRE,
German Silver and Gilding Metal,
Copper Rivets and Burs,
Kerosene Burners,
Shoe Eyelets, Lamp Trimmings, &c.
80 Chambers Street, New York.

8 S. Market Street, Boston.

Rolling Mill, Factories,
THOMASTON, CT. WATERBURY, CT.

Coe Brass Mfg. Co.,
WOLCOTTVILLE, CONN.,

MANUFACTURERS OF

**HIGH AND LOW BRASS,
Gilding Metal,
COPPER and GERMAN SILVER,**
In Sheets and Rolls.

Brass, Copper & German Silver
Wire,

**COPPER RIVETS & BURS,
BRASS, IRON & BRAZIER'S RIVETS.**

A specialty made of
BRASS & GILDING METAL
For Metallic Cartridges.

W. & J. TIEBOUT,
290 Pearl St., near Beekman,
NEW YORK,

Manufacturers of

**CAST BRASS,
GALVANIZED**

AND

**SHIP CHANDLERY
HARDWARE.**

MAX HARNICKELL,
Broker in Metals,
85 Beaver Street,
NEW YORK.
Advances made on Consignments.

**TIN PLATE
and
PIG TIN,**

In Store and For Sale by

A. A. THOMSON & CO.
213 & 215 Water St., NEW YORK.

JOHN W. QUINCY,
98 William Street, New York,

Dealer in

**AMERICAN and FOREIGN SPELTER,
COPPER, TIN, NICKEL,
And Metals generally.**

Fuller, Dana & Fitz,
IMPORTERS AND COMMISSION MERCHANTS,
BOSTON, 110 North Street.

Tin Plates, Sheet Iron, Metals, Iron, Steel, Etc.
Wrought Iron Beams, &c., for Buildings.
Exclusive Boston Agents for the sale of Morris, Tasker & Co's Lap Welded Boiler Tubes. Patent Cold Rolled Shafting. The "Borden Best" Iron, Tensile Strength 75,000 lbs. The Celebrated Bessemer Steel, Brown's Improved Concord Axes. The Salem Lead Co's Lead Pipe.
SWEDISH, NORWAY, ENGLISH, AMERICAN and SCOTCH IRON. RUSSIA SHEET IRON.
FULLER, DANA & FITZ'S Price List on application.

CRAGIN BROS. & CO.
TINNERS' SUPPLIES,
Plumbers' Materials and House
Furnishing Goods,
141, 143 & 145 Lake Street, CHICAGO.
AGENTS IRON CLAD MILK CAN CO.

IRON and STEEL WIRE ROPE,
MANUFACTURED BY
JOHN A. ROEBLING'S SONS
TRENTON N. J.

FOR
INCLINED PLANES, MINING,
STANDING SHIP RIGGING,
SUSPENSION BRIDGES, FERRIES,
STAYS AND GUYS ON DERRICKS,
CRANES & SHEARS, ELEVATOR
TILERS, &c.
A large stock of Wire Rope constantly on hand.
Orders filled with dispatch.
For strength, size and cost see circular
which will be sent on application.

Wire, etc.

**National Wire and Lantern
Works.**
Warehouse, 45 Fulton St., New York

HOWARD & MORSE,
MANUFACTURERS OF
**BRASS, COPPER AND IRON
WIRE CLOTH,**

LOCOMOTIVE
Spark Wire Cloth,
IRON WIRE
BOLTING CLOTH,
Square Wire Sheet Cloth.

Ship and Railroad Lanterns,
Signal Lights, Conductors' Lanterns,
ADJUSTABLE GLOBE HAND LANTERN,
DESK AND OFFICE RAILING
Riddles, Coal and Sand Screens,
NURSERY FENCES & SPARK GUARDS
Ornamental Wire Fence.

GILBERT, BENNETT & CO.,
GEORGETOWN, CONN.,

MANUFACTURERS OF

Iron Wire, Curled Hair & Glue,
Brass, Tinned and Iron Wire Sieves, Coal, Oil
and Hair Sieves, Hair and Wire Gravy Sieves,
Brass and Iron Riddles, Brass and Iron
Wire Cloth, Cheese Sifters, Coal and
Sand Screens, Wire Oz Muzzles.
Also Painted Screen Wire Cloth,
Wood Handle Stove Cover Lifters, Coal Hods,
Pressed and Patent Cast Shovels, Stove
Scrapers and Pokers, Galvanized
Conductor Strainers.
GILBERT'S RIVAL ASH SIEVE.
BLOOD'S PATENT FLOUR SIEVE.
Warehouse, 273 Pearl Street,
NEW YORK.

All kinds of Galvanizing done expeditiously, and
on reasonable terms.

The highest price paid for Cattle's Tails and Hog's Hair.

MANUFACTURERS OF THE
**UNION METALLIC CLOTHES LINE
WIRE,**
the best in use. Agents wanted.

Galvanized Wire
for TELEGRAPHS, CLOTHES LINES, FENCES.
The best in market.

ALFRED FIELD & CO.,
47 John Street, NEW YORK.

**HAMILTON & RAINEAR'S
Philadelphia Wire Works.**
Manufacturers of

WIRE
Of every description. A specialty is made of

**Charcoal Iron and Bessemer Steel
SPRING WIRE.**
No. 1716, 1718, 1720 North 5th Street,
PHILADELPHIA, PA.

Chicago National Wire Cloth Mill,
36 TO 48 DILLER STREET.
EVANS & CO., Proprietors.
OFFICE, 281 MADISON STREET, CHICAGO, ILL.
CRIMPED LOCOMOTIVE SPARK CLOTH
A SPECIALTY.

3 x 3 MESH.				3½x3½ MESH.				4 x 4 MESH.				5 x 5 MESH.				6 x 6 MESH.				8 x 8 MESH.								
No. of Wire	Wt. per sq. foot	Price cts.	Per 100 sq. ft.	No. of Wire	Wt. per sq. foot	Price cts.	Per 100 sq. ft.	No. of Wire	Wt. per sq. foot	Price cts.	Per 100 sq. ft.	No. of Wire	Wt. per sq. foot	Price cts.	Per 100 sq. ft.	No. of Wire	Wt. per sq. foot	Price cts.	Per 100 sq. ft.	No. of Wire	Wt. per sq. foot	Price cts.	Per 100 sq. ft.	No. of Wire	Wt. per sq. foot	Price cts.	Per 100 sq. ft.	
10	3.47	40	11	3.20	38	12	2.80	35	14	2.43	33	16	2.00	30	18	1.39	30	18	1.39	30	18	1.39	30	18	1.39	30	18	1.39
11	2.75	32	12	2.45	31	13	2.15	30	15	1.97	30	17	1.47	25	19	1.08	25	19	1.08	25	19	1.08	25	19	1.08	25	19	1.08
12	2.10	26	13	1.85	25	14	1.62	25	16	1.51	25	18	1.11	20	20	0.76	20	20	0.76	20	20	0.76	20	20	0.76	20	20	0.76
13	1.61	22	14	1.41	20	15	1.31	21	17	1.10	20	19	0.85	18														

These Cloths are used for Mines, Jails, Asylums, and Stock Pens, and are also used for Fences, and for the Walls of
Headways and Floors for Grain Elevators and Grain

These Cloths are used for Mines, Jail, Asylum, and Storehouse Window and Door Guards, Malt Floor
Bulkheads and Floors for Grain Elevators and Grain Vessels. SPECIAL FIGURES FOR LAMP GLASS

Wire, etc.

Washburn & Moen Mfg. Company,
WORCESTER, MASS.
Established 1831.

PHILIP L. MOEN, Pres. WM. E. RICE, Treas.
CHAS. F. WASHBURN, Sec'y.

MANUFACTURERS OF

IRON & STEEL WIRE.

WIRE RODS of all Grades: Round Iron, Rivet quality
3-16 in. to 1/2 in., cut to any length.
Owners and exclusive Operators of the

PATENT CONTINUOUS MILL,
Producing Iron and Steel Wire, in coils of 100 lbs.,
without break or weld.

Plain and Patent Galvanized Tele-
graph Wire.

Market and Stone Wire, Annealed Fence and Grape
Wire in long lengths; Coppered Fall-Rail Wire; Rope,
Bridge, Bolt, Screw, Rivet, Buckle and Chain Wire.
Wire for the Manufacture of Card Clothing, Heddies,
Reeds, &c. Plane-string Covering Wire, Tinned Broom
Wire and Tin-plated Wire of all sizes. A specialty is
made of Clock, Machinery, Gun-Screw and Spiral
Spring Wire, and Refined Wire to Pattern for particular
purposes, from selected stamps of Norway Iron. Any
grade of Wire furnished, Annealed, Bright, Polished,
Coppered, Galvanized or Tin-Plated. Wire furnished,
Straightened and Cut to any length.

Steel Crinoline Wire, Patent Linen finish.

Unriveted Steel Music Wire.

Steel Wire for Springs, Needles and Drills. Market
Steel Wire kept in stock, all sizes.

New Haven Wire Co
MANUFACTURERS OF

**MARKET,
TELEGRAPH,
FENCE,**
and all kinds

IRON WIRE.
New Haven, CONN.

Hartford Wire Works,
Office and Manufactory at
WETHERSFIELD, CONN.

Manufacturers of

WIRE GOODS,
Brass, Copper and Iron
Wire Cloth.

Locomotive Spark Wire Cloth
a specialty.

No. 3 1/2, Mesh, No. 13 Wire.

Coal and Sand Screens, Ash Sifters, Cheese
Sifters, Wire Ox Muzzles, Railroad Car
Brass, Iron and Galvanized Riddles.

Steel Casting Brushes.

Steel and Rattan Brooms and
Flue Brushes,

Wire Flower Stands, Baskets and
Trellises,
Wire Window Guards, &c., &c.

Send for Illustrated Catalogue and Price List,
SAMUEL PARKER & CO.,
Wethersfield, Conn.

JASPER E. CORNING,
MANUFACTURER OF
Heavy Crimped Wire Work
Suitable for Office Railings,
Window Guards, Bank Counters, &c.,
38 CHURCH STREET, NEW YORK.

The Swift Mill.

Established in 1845.



Letter "B" Geared Counter Coffee or Spice Mill.

Stands nearly 2 1/2 feet high. Is highly finished, colors deep Vermilion and Gold. We make more than 30 different styles and sizes.

Send for catalogue. Manufactured exclusively by
LANE BROTHERS,
Millbrook, N. Y.

T. C. RICHARDS & CO.,

47 Murray Street, N. Y.

Manufacturers of Richards' Patent Porcelain-head Picture Nails; also, Porcelain Picture, Drawer, Shutter, and Door Knobs, etc., etc.

Importers of German Brass Goods, also, China, Glass, Steel, and Silver Furniture Nails Wire Nails, etc., etc.

We particularly invite the attention of large buyers to our Patent Picture Nails and Knobs being a specialty with us, we offer satisfactory discounts on good orders.



O. LINDEMANN & CO.,
Manufacturers of
Japanned and Patent Bright Metal
BRASS CAGES,
Pat. Oct. 4th, 1870, Nov. 7th, 1871, Dec. 18th, 1872.
Office and Salesroom, No. 333 Pearl St., New York
Factory, Nos. 322, 324 & 326 Pearl Street.

Geo. A. Boynton, BROKER IN IRON 70 WALL ST., N. Y.

IRON, NAILS, NUTS, WASHERS, AND CAR-
RIAGE BOLTS.

PACKARD, GOFF & CO.,

JOURNALERS OF

Iron, Nails, Nuts, Washers, and Carriage Bolts.
YOUNGSTOWN, O.

We have three Rolling Mills, a Nut and Bolt Factory located here. Orders solicited.

RIEHL BROTHERS,
Ninth Street, near Coates, Philadelphia.
New York Store, 93 Liberty Street,
Pittsburgh Store, 73 Water Street.



"The Celebrated Stock House Scale,"
New Style Testing Machines, all sizes,
Wrought Iron Lever B. R. Truck Scales,
Parallel Crane Scales and Hoisting Ma-
chines.

CHAS. BROMBACHER,
Tarrytown N. Y.

MANUFACTURERS OF

**TINSMITHS' TOOLS AND MACHINE
PAPER BOX MAKERS' DO.,
PRODUCE TRYERS, & C**

E. KETCHAM & CO., 289 Pearl Street,
New York Agents.

P. W. GALLAUDET,
Banker and Note Broker,
Nos. 3 and 5 Wall Street,
NEW YORK.

HARDWARE, METAL, IRON, RUBBER, SHOE
PAPER AND PAPER-HANGINGS, LUMBER, COAL
AND RAILROAD PAPER WANTED.
ADVANCES MADE ON BUSINESS PAPER AND
OTHER SECURITIES.

HENDRYX & BARTHOLOMEW,

MANUFACTURERS OF

**WIRE CLOTH,
BRASS & COPPER WIRE CLOTH,**

Locomotive Spark, Hardware Grade, Galvanized
and Tinned Iron Wire Cloth, Green, Drab, Black
and Landscape Wire Window Shade Cloth, Brass
Milk Strainer Cloth.

Special Orders will receive prompt attention.
ANSONIA, CONN.

New Patents.

We take from the records of the patent office at Washington the following specifications of certain patents lately issued, which will be found interesting:

IMPROVEMENT IN LINING ROTARY PUDDLING FURNACES.

Specification forming part of Letters Patent No. 136,421, dated March 4, 1873, issued to Samuel Danks, Cincinnati, Ohio.

We publish the following verbatim: This invention relates to a novel method of lining rotary puddling furnaces, and more especially the furnace described in the specifications of former Letters Patent heretofore granted to me.

The material of which improved furnace lining is made is a compound of lime and oxide or silicate of iron or other metallic oxides, to which I sometimes add soda or potash, or other alkali, or common salt, or a quantity of all of these substances.

In making this compound, I dissolve the lime in water to the consistency of a thick cream. If the soda, potash, or salt is to be used, the same should be dissolved in the water before mixing the lime therein. I then add to this cream iron ore well pulverized, or other oxide or silicate, in such proportions as will give the compound the consistency of stiff mortar.

In lining the aforesaid furnace with my improved compound, I proceed as follows: The part of the inner surface of the revolving cylinder or chamber which occupies the lowest position is first covered with the aforesaid compound between and over the hollow ribs of the said cylinder. The compound is then dried, or allowed to dry, and becomes quite hard. The cylinder is then turned partially round, the said hollow ribs holding the compound securely in place. By thus turning the cylinder on its axis another portion of its surface is brought to the lowest position, and this portion is covered in like manner with the compound, which in turn is dried or allowed to dry, and the cylinder is again turned partially round, and so on till its entire surface is lined or coated with the aforesaid compound to a depth of about one inch above the top of the hollow ribs. When dry the said compound is very hard, and will not be displaced or fused by the heat of the furnace.

The aforesaid compound is also applied to the bridge plate and the lower part of the shiftable piece described in the said former specifications to form a protective lining or coating for the same.

When the aforesaid lining or coating of the cylinder or chamber is dry, I make a fire in the furnace and introduce into the said cylinder pulverized iron ore, or other oxide or silicate of iron, and melt the same in the cylinder, the latter being caused to revolve slowly. Then the temperature is slightly reduced to allow the molten oxide or silicate to set upon the surface of the compound and form a vitreous lining or covering thereon. Care must be taken that the ends of the revolving cylinder as well as the circular portions of its inner surface are covered both with the compound and the molten oxide or silicate.

After the first vitreous coating has been allowed to set or harden, a fresh quantity of pulverized iron ore or other oxide of iron is thrown into the cylinder and melted therein. Then the revolution of the furnace is stopped, and the molten ore or oxide forms a bath in the bottom or lower portion of the revolving cylinder or chamber. Into this bath a number of large pieces or lumps of iron ore or oxide of iron, or other metallic oxides or suitable refractory material, are thrown. The molten ore or oxide, being thereby slightly cooled, sets or hardens, holding these pieces embedded in it, with their upper portions projecting above its surface. A further quantity of iron ore or oxide is then thrown into the cylinder and melted, the cylinder being set in motion, as before. When this fresh quantity of the ore or oxide is melted the cylinder is stopped in a position nearly opposite to its last position; the molten ore or oxide again forming a bath opposite, or nearly so, to that in which the aforesaid pieces are embedded.

Into this bath I also throw a number of large pieces of iron ore, or other metallic oxides or refractory material, which are set in the furnace by the cooling of the bath, with their upper portions projecting like those first described. This operation is repeated till five or six portions or the entire surface of the cylinder have been set with these projecting pieces, care being taken to cool the molten ore or oxide with the pieces or lumps therein in such positions that the cylinder shall remain evenly balanced on its axis.

The furnace is then ready for puddling. As the lining wears it may be repaired from time to time by a repetition of the above processes. In some cases the iron ore or oxide of iron may be melted in a separate furnace and poured in a molten state into the hot revolving chamber to form or renew the lining.

Claims.—1. A lining or fettling consisting of the above described compound, applied to the interior of the cylinder of a rotary puddling furnace, and coated or covered with iron ore or other oxide or silicate of iron, as herein set forth.

2. The aforesaid lining or fettling of the cylinder of a rotary furnace, when there is fixed within said lining projecting pieces of iron ore or other suitable refractory material, as herein set forth for the purpose specified.

IMPROVEMENT IN APPARATUS FOR CONDENSING AND PURIFYING THE SMOKE OF METALLURGIC FURNACES.

Specification forming part of Letters Patent No. 136,066, dated February 18, 1873, issued to William J. Johnson, of Allendale, England:

This invention is designed to effect the condensation and purification of smoke, vapors, fumes and gases evolved from furnaces, hearths, or other places where combustion is carried on; the object of the said invention being to condense, or extract, the soot or unconsumed carbon, and any metallic sulphur-

ous, deleterious, and other particles that may be contained therein, and to allow the purified vapor only to escape into the atmosphere; and the apparatus to be employed for this purpose consists, principally, of a revolving wheel, or drum, with projections dipping into water, or other liquid, for the purpose of producing a shower, or spray, in combination with an inclined screen constructed, as hereafter explained, of a number of partitions provided with horizontal ribs, between which the smoke, fumes or vapor is caused to pass under the influence of the shower, or spray. In any convenient part of the flue, between the furnace, or hearth, and the chimney, or outlet, a chamber is formed, the bottom part of which serves as a tank to contain water, or other liquid. Above the surface of such water, or liquid, is mounted a revolving wheel, or drum, having projections or wings, on the periphery, which dip into the water, and, as the wheel, or drum, revolves, throw up a shower, or spray, in an inclined direction. In advance of this wheel, and near to the chimney, is a net-work, or an inclined screen, constructed of a number of vertical partitions of graduated heights, those nearest to the wheel being the lowest, so that the top of

forming a screen, in passing through which the smoke or fumes become thoroughly washed and purified, as previously described. The arrows show the course of the smoke or fumes. *k, k* represent a jet of steam, which may be placed at the foot of the chimney, if further aid to the draft should be required.

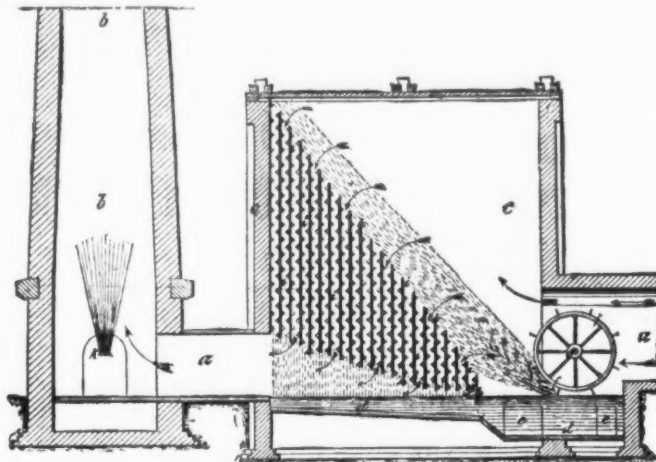
Claim 1. The combination, with a flue for the passage of the products of combustion, of a series of slats, or a screen, or its equivalent, from which water is caused to fall in a constant shower, substantially as described.

2. The combination, with the slats, or screen, of a wheel, by which water is thrown upon the slats, as specified.

IMPROVEMENT IN METALLURGIC GAS-FURNACES.

Specification forming part of Letters Patent No. 135,639, dated February 11, 1873, issued to Himan Frank, of Pittsburgh, Pennsylvania.

In gas-furnaces the gas and air, which form the elements of combustion, are brought to the mouth of the combustion chamber or bed in separate flues, and are there united or commingled by flowing into each other. It is a matter of some difficulty to intermix them thoroughly. When this is not done a portion of the air or gas remains unchanged and passes



IMPROVED APPARATUS FOR CONDENSING AND PURIFYING SMOKE.

the partition forms an incline at about the same angle that the shower, or spray, is thrown off from the wheel, or drum. These partitions are provided with laths, ribs, or gratings, set horizontally, or at an inclination, and the whole screen is so arranged and situated that the smoke, fumes, or vapor passing from the furnace, or hearth, to the chimney, or outlet, must necessarily pass through the spaces between these said partitions, while the shower of water is projected over the top of the same and falls down in a minutely divided state from one lath, rib, or grating to the other between the partitions. By these means all soot or carbon in a solid state is washed out of the smoke, and also all acids or soluble or insoluble metallic sulphurous, or other particles are removed therefrom. In fact, the smoke, fume, or vapor becomes thoroughly washed and purified on its passage through the shower or spray and between the partitions, and only the purified vapor escapes by the chimney or otherwise to the atmosphere. The water from the partitions falls again into the tank, and is used over and over again. The soot or carbon, and also the other matters extracted from the smoke or vapor, whether solid or in the form of a solution, may be extracted from the wash-water and utilized in a variety of ways, according to the nature of the material under combustion.

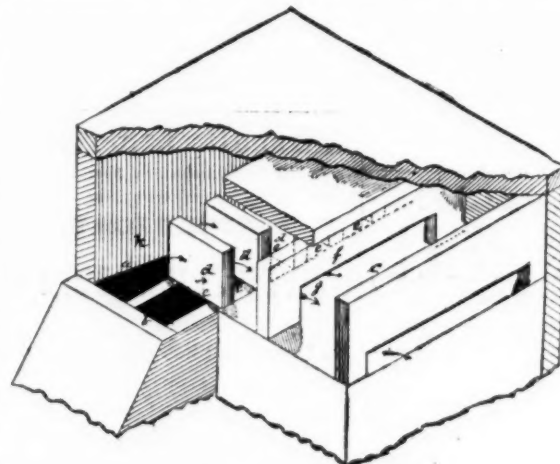
Instead of a drum or wheel, as above described, any other means of producing a shower or spray by water under pressure, or by the condensation of steam, might be employed in combination with the screen; and by putting vanes on the wheel and admitting the smoke, fume, or vapor at the center, the draft may be greatly accelerated.

The accompanying drawing is a longitudinal section, taken vertically through the apparatus. *a a* is a part of the flue leading from the furnace, hearth, or other place where the combustion is carried on; and *b b* is the lower part of the chimney. *c c* is the purifying chamber, the bottom part of which forms a tank, *d d*, for containing the water or other liquid employed, the lowest part of this tank being carried outside the flue, and open at the top, so as to allow of access to remove the solid or other matters extracted from the smoke or fumes, which may be utilized in a variety of manners, according to the nature of the material under combustion. The escape of smoke or gases at this point is prevented by placing the openings *e e* (communicating with the interior) below the level of the water or other liquid. *f f* is the wheel for throwing up the spray or shower of water or other liquid. It is mounted on a shaft, *g*, which passes through the wall of the flue, and is driven at the requisite speed by means of a band pulley or toothed wheel in connection with the steam engine or other motive power. This wheel is shown in the drawing with tines or pegs dipping into the water or other liquid; but, as previously mentioned, it may be made in the form of a fan, so as to increase the draft, in which case the flue would be carried outside the ends, and the smoke or fumes be drawn in round the axle; or other means for throwing up a spray or shower in the manner indicated in the drawing might be employed. The inclined screen or grating consists of a number of vertical partitions, *h h*, of graduated heights, the partition next to the wheel being the lowest, and dipping into the water or other liquid so as to prevent any smoke or fumes from passing to the chimney excepting through the screen. On each side of each partition there are fixed, either horizontally or at an inclination, several laths or ribs, *i i*, of an angular or other suitable section, the whole

off through the neck of the furnace, detracting from the heat in the chamber, more or less, in proportion to the amount unconsumed; hence it is desirable to construct the furnace and its entrance-flues in the manner which will secure the most intimate and thorough admixture of the air and gas.

The object of my invention is to arrange the air and gas flues in such a manner that they shall not discharge their respective currents directly into the furnace-bed, but into an intermediate flue leading to the bed, which intermediate flue is subdivided by tile in the manner hereinafter described, so as to form a number of passages, through which the air and gas pass on their way to the furnace. The result of this construction is a very intimate admixture of the air and gas before they enter the combustion chamber. This is further aided by the peculiar construction of the bridge, which also forms a portion of my invention.

In the drawing, *a* represents the air flue, and *b* the gas flue, which lead up into the bed *c*. Placed transversely across the mouth of the flue *b*, at stated intervals, is a series of tile, *d d*, which divide the entrance flue *b* to the bed *c* into a number of small passages, *e e*. A little in advance of the opening *e e* is a bridge, *f*, having a reduced opening, *g*, which forms the entrance to the bed *c*. The object of the tile *d d* is to divide the inflowing air and gas into



IMPROVEMENT IN METALLURGIC GAS FURNACES.

numerous small currents for the purpose of causing their more intimate intermixture; and the object of the bridge *f* with the reduced opening *g* is to draw the currents into one current again for the same purpose. The bridge *f* is removable through openings in the sides of the furnace, so as to facilitate repairs.

Claim.—1. The tile *d d*, placed in the mouth of the furnace for the purpose of dividing the inflowing volume of gas and air into a number of smaller currents, for the purpose of causing their more intimate admixture prior to their entrance into the combustion chamber or bed, substantially as described.

2. The fire bridge *f*, having a contracted or reduced opening, *g*, in combination with the tile *d d*, for the purpose of causing the more intimate admixture of the inflowing air and gas, substantially as described.

3. The fire bridge *f*, made removable, substantially as and for the purposes described.

Smith & Wesson have concluded with the Russian government a duplicate contract, and will at once commence the manufacture of 200,000 more revolvers for the Russian army.

The St. Louis Bridge.

The Missouri Democrat says: The gradual clearing up of the river from the ice that has encumbered it during the winter is hailed with pleasure by Capt. Eads and the engineers and contractors in charge of the construction of the bridge. The completion of this will signalize the commencement of the work of the superstructure. In other words, the piers and abutments having been almost completed, engineers with a large force of workmen will commence in a few days the final work of constructing the three arches on which the superstructure will be placed.

The work of throwing the arches, which are constructed of steel tubes, across these spans of 400 feet each, is one of almost superhuman difficulty. It is not easy to convey on paper an idea of the difficulty of the problem. Work will be commenced simultaneously on both sides of the river on the construction of the two extreme spans. One quarter of each span will support itself. Should another piece or segment be added the structure would fall of its own weight, and the problem is to construct the arches across the intervening distances. For this purpose heavy frame-work towers are being erected on both abutments, over which huge cables will pass to support the steel arch as it advances to the center of the span. Iron work will crown the top, and hydraulic jacks will be placed under it to support the weight and secure the proper tension of the cables. On the west side the cable is to be sunk in the solid rock to a depth of 25 feet. As the segments of the arch are placed in position they are bound together by diagonal braces until one-quarter of the span is reached. Then the immense cables are brought into requisition, and as another segment is added it is fastened to the remainder of the arch until it, too, can be braced. Then the cable is loosened and again brought in requisition for the addition of another segment.

This is the mode of the construction of the spans. The east and west spans, it is said, will be begun and finished simultaneously, when work on the two center spans will be commenced. The contract for the superstructure is in the hands of the Keystone Bridge Company.

The present prospects are most encouraging. Car-loads of steel work, which is supplied by the Midvale Steel Works, of Philadelphia, are arriving daily. Up to this time 4,800,000 pounds, about nine-tenths of the whole amount needed, have been delivered. Unless unexpected obstacles occur, the arches will be raised, the superstructure and approaches completed, and the bridge in its entirety completed early next fall.

Mineral Resources of Kansas.

Recent geological surveys show that the State of Kansas promises mineral resources which are to be extensive and important. Coal of good quality has been found to extend through twelve counties. Iron, lead and zinc are abundant, and the deposits of gypsum and manganese are comparatively inexhaustible. Copper is found in paying quantities, and marble, whet and limestone, rock crystal, mineral paints, kaolin, granite, freestone, various kinds of marl, grindstones, and slate are distributed throughout the State.

The Kellogg Lead Mines afford an insight into the mineral deposits of the State. These mines are located about ten miles northeast of Little Rock, and about six miles from the Cairo and Fulton Railroad. The mines are in a very deep valley, lower than the bed of the Arkansas River, where the lead crops out. These mines have only been operated at intervals and to a very small extent, but recently have passed into the hands of a wealthy company, who in the

spring will commence active operations. The deposit is found in parallel fissure veins, that crop out at intervals of a distance of about three miles. These have been penetrated only about forty feet, with increasing deposits. About 350 tons of galena have been taken out.

The deposit is composed principally of argentiferous galena, zinc blende, copper pyrites and feldspathic iron.

This galena never yields less than \$40 to the ton of lead, and has yielded as high as \$400. Copper in small quantities is found, often containing as high as 24 ounces of silver and two and a half of gold to the ton, while the argentiferous copper has yielded as high as from \$1000 to \$4000 to the ton. These estimates of the deposit of silver and gold are from the official assay of the mint at Philadelphia, and the United States Assay office at New York.

Prof. Tacchella has invented a working model which serves as a fire escape and a fire-proof, self-supporting fire ladder. In less than three minutes time it becomes a fire proof tower, on which there are two hoses on the top and eight or ten firemen; two abreast can work through metal windows on the fire. Placed before open windows where fire is pouring out, it is claimed that it cannot even become warm. It is raised by a semicircular gear or cog-wheel turned by four cranks, and four men only are necessary to put it in operation. The fire escape is an endless canvas working on two rollers, saving thirty or forty persons at a time. The whole apparatus will weigh two tons and cost \$3000.

Iron. NEW YORK.	Iron. NEW YORK.	Iron. NEW YORK.	Iron. NEW YORK.	Iron. PITTSBURGH.
GAM'L G. SMITH & CO., IRON WAREHOUSE, 342, 344 & 346 Pearl Street, New York. Importers and Dealers in IRON AND STEEL, COMMON AND REFINED BAR IRON, SHEET AND PLATE IRON, Rod, Hoop, Band, Scroll, Horse Shoe, Angle and Tee Iron, PIG IRON, OLD RAILS, WROUGHT IRON BEAMS. Iron of all sizes and shapes made to order.	Conklin & Huerstel, Successors to M. W. DEAN. "IRON MERCHANTS," 99 Market Slip, N. Y. Keep constantly on hand a full assortment of English and American Refined Iron, COMMON IRON, Band, Hoop and Scroll Iron, Norway Nail Rods and Shapes, Cast, Spring, Toe Calk and Tire Steel. Goods Shipped free of Cartage.	BIGELOW & JOHNSTON, Iron and Steel Rails, PIG AND SCRAP IRON, OLD RAILS. 48 Pine St., Rooms 9 and 10.	S. W. HOPKINS & CO., 57 Broadway, New York.	Pittsburgh Foundry. A. GARRISON & CO., Manufacturers of
PIERSONS & CO. S Iron Warehouse, No. 24 Broadway and 77 & 79 New St., NEW YORK. Importers and Dealers in IRON & STEEL of every description. Agents for the sale of Ulster Iron, Messrs. H. Burden & Sons' L. B. & S. and Burden's Best Iron. A. Norton & Sons' Steel. Keep constantly in stock a full assortment of Common and Refined Iron, Bagnall's Ulster, Bur- den's and H. B. & S. Iron. Bands, Rods, Hoops, Scrolls, Ovals, Half Ovals, and Half Rounds, Angle and Tee Iron, Beams and Channel Iron, Sheet and Plate Iron, Nail Rods, Norway Shapes, etc. Cast, Spring, Toe Calk, Tire, Sleigh Shoe and Plow Steel, etc., at lowest market rates.	WM. GARDNER, 575 Grand, 414 Madison & 302 Monroe Sts. Bar, Hoop, Rod, Band and Horse Shoe Iron. AGENT FOR Best Norway N. R. & Shapes, Spring, Toe Calk, Tire & Sleigh Shoe Steel. BORDEN & LOVELL, Commission Merchants 70 & 71 West St., New York. Agents for the sale of Fall River Iron Co.'s Nails, Bands, Hoops & Rods, AND Borden Mining Company's Cumberland Coals. GILEAD A. SMITH & CO., Bartholomew House, Bank, No. 30 Pine St., N. Y. London. P. O. Box No. 5070. RAIL ROAD IRON In Ports of New York & New Orleans. Steel Rails of most approved Makers. Importers of Old Iron Rails for re-rolling. Bills of Exchange on Imperial Bank, London.	HAZARD & JONES, BROKERS. NEW & OLD RAILS, FOREIGN AND DOMESTIC Pig Iron, Wrought & Cast Scrap Iron, &c., 212 Pearl St., New York. Geo. A. Boynton BROKER IN IRON 70 WALL ST., N. Y.	OLD RAILS, and are therefore always in a position to furnish to consumers any quantity desired for immediate or remote delivery: and when required will contract to supply Mills with their monthly or yearly consumption at the lowest current market prices. We are also prepared to receive orders for SCRAP IRON, both Wrought and Cast, of every description, and have always a supply at dock, and to arrive. Great care is taken in properly selecting and classifying the same by our LONDON HOUSE, 58 Old Broad Street, who give this department of our business their per- sonal attention. When preferred, we are ready to execute orders from abroad at a sterling price, charg- ing a commission for our services.	CHILLED AND SAND ROLLS, Of acknowledged superior quality, at the lowest cur- rent prices. Ore and Clay Crushers, and Roll- ing Mill Castings, of every description. Office and Warehouse, 209 Liberty Street. PITTSBURGH, PA.
JACKSON & CHACE, 206 & 208 Franklin St., N. Y. Importers and Dealers in IRON and STEEL. Agents for JOHN A. GRISWOLD & CO'S Bessemer Steel. Agents for UNION IRON MILLS, Wrought Iron Beams, ANGLE and T IRON. Special Irons for Bridge and Architectural Work.	Wm. Borden, L. N. Lovell, Agents for the sale of Fall River Iron Co.'s Nails, Bands, Hoops & Rods, AND Borden Mining Company's Cumberland Coals. GILEAD A. SMITH & CO., Bartholomew House, Bank, No. 30 Pine St., N. Y. London. P. O. Box No. 5070. RAIL ROAD IRON In Ports of New York & New Orleans. Steel Rails of most approved Makers. Importers of Old Iron Rails for re-rolling. Bills of Exchange on Imperial Bank, London.	WILLIAM H. PETIT, BROKER IN IRON, 72 Wall Street, N. Y.	S. W. HOPKINS & CO. HARRISON & GILLOON IRON AND METAL DEALERS, 58, 560, 562 WATER ST., and 302, 304, 306 CHERRY ST., NEW YORK. have on hand, and offer for sale, the following: Scotch and American Pig Iron, Wrought, Cast and Machinery Scrap Iron, Car-Wheels, Axles and Heavy Wrought Iron; also old Copper, Composition, Brass, Lead, Pewter, Zinc, &c.	REES & CO., Manufacturers of CORRUGATED SHEET IRON, PLAIN AND GALVANIZED. PITTSBURGH PA. PENNSYLVANIA IRON WORKS. EVERSON, GRAFF & MACRUM. Pittsburgh, Pa. Manufacturers of every description of Bar, Sheet and Small Iron, Make a specialty in Fine and Common Sheet Iron.
ABEEL BROTHERS, Successors to JOHN H. ABEEL & CO., Iron Merchants, 190 South Street and 365 Water, N. Y. ULSTER IRON A full assortment of all sizes constantly on hand. English and American Refined Iron of choicest brands. Common Iron. Band, Hoop and Scroll Iron. Sheet Iron. Norway Nail Rods. Norway Shapes. Cast, Spring and Tire Steel, etc.	Edward Page & Co., (Successors to Frykberg & Co.) Swedish & Norway Iron, Boston Rolling Mill, SHAPES, NAIL RODS AND WIRE RODS, OFFICES: 17 Battery-march Street, BOSTON, 22 William Street, NEW YORK, 205 1-2 Walnut Street, PHILA. GOTHENBURG, SWEDEN.	JAMES WILLIAMSON & CO., SCOTCH AND AMERICAN PIG IRON, No. 69 Wall St., New York. B. F. JUDSON, SCOTCH AND AMERICAN PIG IRON, Wrought and Cast Scrap Iron. 457 and 459 WATER STREET, And 235 SOUTH STREET, near Pike, NEW YORK.	JAMES T. MAGUIRE, MANUFACTURER Builders' Wrought Iron Goods, HOOKS HASPS AND STAPLES, Awning Hooks, Corner Irons, Rings, Meat Hooks, Horse S. Pincers, Tongues, &c. See Price List. Messrs. WM. F. SHATTUCK & CO., 115 Chambers Street, Agents, &c. Manufactory, 608 E. 11th St., New York.	AMERICAN IRON WORKS. Jones & Laughlins, Manufacturers of Bar Plate and Sheet Iron, Nails, Ship and Railroad Spikes, R.R. Splice Bars and Felt, Celebrated Cold-Rolled Shafting, Piston Rods, &c. PITTSBURGH, PA. 40 42 and 44 River Street CHICAGO. Stocks of Cold-Rolled Shafting in store and for sale by Messrs. FULLER, DANA & FITZ, Boston, Mass. Messrs. GEORGE PLACE & CO., New York. Messrs. PEIRCE & WHALING, Milwaukee, Wis.
Alfred R. Whitney, Importer and Dealer in IRON AND STEEL, Well assorted stock of Angle and T Iron, To 3 feet in length, constantly on hand. 56, 58 & 60 Hudson, and 49, 51 & 53 Thomas Sts., N. Y. English and American Manufacturers' AGENT FOR IRON Used in the Construction of Fire-Proof Buildings, Bridges, &c. Books containing Cuts of all iron now made, sent by mail. Sample pieces at office. Please address 35 Hudson Street.	Marshall Lefferts, Jr., 94 Beekman St., New York, MANUFACTURER OF AMERICAN Galvanized Sheet Irons AND AGENT FOR THE Easton Sheet Iron Works, Easton Pa. MANUFACTURER OF Best Bloom, Charcoal & Refined Sheet Iron. Galvanized Telegraph and Fence Wire Galvanized and Tinned Roofing and Slatting Nails. Galvanized Tea Kettles. Galvanized Hoop Iron of all widths. Galvanized Staples. Corrugated Iron for Roofing, plain or gal'd. Galvanized Bars and Chains for Cemetery Railing.	JOHN W. QUINCY, 98 William Street, New York Dealer in Anthracite & Charcoal Pig Irons, OLD SCRAP and CUT NAILS. Gibbs' Patent Lock Nut and Washer, and Fish Plates for Rail Roads. BOONTON CUT NAILS, HOT PRESSED NUTS, Machine Forged Bolts, Washers. Fuller, Lord & Co., BOONTON IRON WORKS, 139 Greenwich Street, New York.	OXFORD IRON CO., Cut Nails and Spikes, R. R. Spikes, Splice Bars and Nuts and Bolts, 81, 83 & 85 Washington, near Rector St, N. Y. COLLIER & SCRANTON, Agents.	SOLAR IRON WORKS. Wm. Clark & Co. MANUFACTURERS OF HOOP, BAND AND SCROLL IRON Railroad St., above 33d, PITTSBURGH PA.
POWERVILLE ROLLING MILL, JOHN LEONARD, Proprietor, 450 & 451 West Street, NEW YORK. Manufacturer of all sizes of MERCHANT IRON and HOOPS. Also Manufacturer of Best Charcoal Scrap Blooms. And Dealer in Old and New Iron, Steam Engines, Boilers and Tanks.	T. B. CODDINGTON & CO., 25 & 27 Cliff St., New York. Bar Iron, Sheet Iron, &c Of every description	Swedish Iron. A Variety of Brands, including UB G.F. AB SF BARS suitable for Steel of all grades, Wire, Shov- els, Hoops, Scythes, Carriage Bolts, Nail Rods, Tacks, etc. CHARCOAL PIG IRON for Bessemer and Car Wheels. MUCK BARS for Steel Smelting and Re-rolling. SCRAP or BAR ENDS. Direct Agency for N. M. HÖGLUND, of Stockholm, represented in the United States by NILS MITANDER, 69 William St., New York. DANIEL W. RICHARDS & CO., Importers and Dealers. SCRAP IRON, Pig Iron, OLD METALS. YARDS: 88, 90, 92, 94, 96, 98, 100, 102 & 104 Mangin St. And 71, 73, 75 77 & 79 Tompkins St. OFFICES: 92 Mangin Street, 178 Pearl Street, near Pine Street.	DAVID CARPENTER, Manufacturer of HOT PRESSED NUTS, And Dealer in All kinds of Refined Bar & Horse Shoe Iron, 402 Water Street, New York.	W. P. TOWNSEND & CO., Manufacturers of WIRE and Black and Tinned Rivets OF CHOICEST CHARCOAL IRON. Rivets any diameter up to 1-16 inch and ANY LENGTH required. 19 & 21 Market St., PITTSBURGH PA.
A. B. Warner & Son, IRON MERCHANTS, 28 & 29 West and 52 Washington Sts. BOILER PLATE, Boiler Tubes, Angle, Tee & Girder Iron, Boiler and Tank Rivets. Sole Agents for the celebrated "Eureka," Pennocks, "Wawasset," Lukens, Brands of Iron. Also all descriptions of Plate, Sheet and Gasometer Iron. Special attention to Locomotive Iron. Fire Box Iron a specialty.	The Corrugated Metal Co. D. F. Townner, East Berlin, Ct. C. A. Roys, Secy. Pres. & Tre. N. C. North, Supt. MANUFACTURERS OF PATENT CORRUGA- TED FIRE-PROOF SHUTTERS, ROOFING, SIDING, LATH, CEILING, FLOORING, SHINGLES, &c. Work in our line put up in all parts of the country, and guaranteed satisfactory.	The Corrugated Metal Co. D. F. Townner, East Berlin, Ct. C. A. Roys, Secy. Pres. & Tre. N. C. North, Supt. MANUFACTURERS OF PATENT CORRUGA- TED FIRE-PROOF SHUTTERS, ROOFING, SIDING, LATH, CEILING, FLOORING, SHINGLES, &c. Work in our line put up in all parts of the country, and guaranteed satisfactory.	THE SPRINGFIELD IRON COMP'Y, SPRINGFIELD, ILLINOIS, Is now ready to receive orders for the manufacture of IRON RAILS, Of a quality second to none. Capacity of Works, 25,000 tons per annum. Chas. Ridgely, Pres. J. W. Bunn, Vice Pres George M. Brinkerhoff, Secy. E. A. Richardson, Supt. Agent in New York, GEORGE T. M. DAVIS, 47 Exchange Place.	Boston Rolling Mill Manufacture extra quality small Rods, from best se- lected Scrap Iron. Swedish and Norway Shapes, NAIL and WIRE RODS. Also HORSE SHOE IRON. W. R. ELLIS & CO., Proprietors. Office, 17 Battery-march St., Boston.
ASBESTOS FELTING, For Steam Boilers, Pipes, &c. Saves 25 to 40 per cent. in fuel. The best in use Durable and Economical. For circulars and prices, address DAVIDGE & WHEELER, General Agents Asbestos Felting Co., of New York P. O. Box, 4570. 781-2 Pine St., N. Y.	DAVIDGE & WHEELER, General Agents Asbestos Felting Co., of New York P. O. Box, 4570. 781-2 Pine St., N. Y.	THE CORRUGATED METAL CO. D. F. Townner, East Berlin, Ct. C. A. Roys, Secy. Pres. & Tre. N. C. North, Supt. MANUFACTURERS OF PATENT CORRUGA- TED FIRE-PROOF SHUTTERS, ROOFING, SIDING, LATH, CEILING, FLOORING, SHINGLES, &c. Work in our line put up in all parts of the country, and guaranteed satisfactory.	BURDEN'S HORSE SHOES. "Burden Best" Iron. Boiler Rivets. Burden Iron Works, H. Burden & Sons, Troy, N. Y.	HALL, KIMBARK & CO., IRON, STEEL, NAILS, HEAVY HARDWARE. 80, 82 & 84 Michigan Ave., Chicago. LYNCHBURG IRON WORKS, F. B. DEANE, Jr., & SON, Proprietors, LYNCHBURG, VA. MANUFACTURE RAILROAD, BOAT & COUNTERSUNK HEAD SPICES, FISH PLATES & BOLTS, Bridge Rods, Hexagon, Square, T and But- ton Head Bolts, Bolt Ends, Rivets, Car Wheels from best Cold Blast Charcoal Iron, Locomotive, Car, Engine and Bridge Cast- ings, Chilled Rolls, Rolling Mill and Blast Furnace Castings.

W. S. BLUNT, 86 Beekman Street, New York.Will Remove to 77 Beekman St.,
May 1st. 1873.Sole Agent for the Sale of manufactures
of the**AMERICAN PUMP CO.,**
of PETERBORO, N. H.Plumbers and the Trade are re-
spectfully invited to call and examine our
goods and send for Catalogue and Price
Lists.Our Force Pumps are the most compact and powerful in the
market.**In Door & Out Door Force Pumps,****Deep Well Pumps.****Iron Standard Yard Force Pumps.****Patent Double Acting Hydraulic Rams**

a specialty, and the best in the market. Also,

GARDEN ENGINES, New & Improved Pattern,
PATENT "MUSHROOM STRAINER"

for all Suction Pumps.

Will draw in three inches of water
without disturbing the bottom, even
if water is let out of pump. Very
useful for pumping out cellars,
drawing liquid from tanks,
when sediment is to be avoided.Agents for the Pacific Coast and
Territory west of the Rocky Moun-
tains:**Conroy, O'Connor & Co.,**

SAN FRANCISCO, CAL.

W. & B. DOUGLAS,

MIDDLETOWN, CONN.

The Oldest and Most Extensive Manufacturers of

PUMPS,
HYDRAULIC RAMS,
GARDEN ENGINES

AND OTHER

Hydraulic Machines

IN THE

UNITED STATES.Several Hundred Kinds, Styles and Va-
rieties of these Articles in Large Stock, con-
stantly on hand.Highest Medal awarded them by the Universal Exposition, at
Paris, France, in 1867.
Descriptive Catalogues and Price Lists sent when requested.**BRANCH WAREHOUSES,****85 & 87 John Street, NEW YORK.**

AND

197 Lake St., CHICAGO, ILL.**UNION MANUFACTURING COMPANY,**

Manufacturers of all styles

PLAIN AND ORNAMENTAL**Cast, Fast & Loose Butts,**

Drilled and Wire Jointed.

Japaned, Figured Enamelled, Nickel Plated,
with and without Cap, and Real Bronze Butts.
Also, a full line of**IRON AND BRASS PUMPS,**Garden, Well, and Force Pumps, Yard, Drive
Well, Garden Engine and Steam Boiler Pump,
Hydraulic Rams, etc., and all with the most modern
improvements.

25 Fine Castings a Specialty.

NEW BRITAIN, CONN.

Warehouse, 53 Chambers Street, NEW YORK.

Send for New Illustrated Catalogue and Price List.

THE LARGEST
PUMP WORKS,
IN THE WORLD.

Over 800 different styles

Pumps, Steam Pumps, Rotary Pumps, Centrifugal
Pumps, Piston Pumps,for Tanners, Paper Mills, Fire Purposes, suitable for all situations imagin-
able. Send for Catalogue. Address**RUMSEY & CO.,****SENECA FALLS, N. Y.**

ALSO, FOR

Hand Fire Engines,Address **RUMSEY & CO., Seneca Falls, N. Y., U. S. A.****WRIGHT'S****Double Acting,**
BUCKET - PLUNGER
STEAM PUMPS.**ALWAYS RELIABLE****VALLEY MACHINE CO., Easthampton, Mass.****Woodward Steam Pump Mfg. Co.****Steam Pump and Fire Engine,**Steam, Water and Gas Fitting of all Kinds.
Also, Wholesale and Retail dealers in WROUGHT
IRON PIPE, BOILER TUBES, etc.**Woodward Building, Nos. 76 & 78 Centre St.,**corner Worth Street, **NEW YORK.****GEO. M. WOODWARD, Pres't.****The Minerals of New Jersey.**We take the following from the annual report
of Mr. Geo. H. Cook, State Geologist, of New
Jersey, just issued:**MAGNETIC IRON ORE.**The mines of magnetic iron ore continue to
be worked with vigor, and the number of local-
ities furnishing ore are steadily increasing under
the impetus from the urgent demands of the
furnaces for larger supplies. All of the
mines which were included in the report of last
year, have been worked a portion if not all the
past season, and their number has been in-
creased by the resumption of work at several
old mines which had been idle since the close
of the war. In the iron districts of Morris
county larger quantities of ore have been
raised this year than ever before, the Hibernia
mines having furnished a total of 90,000 tons to
the Hibernia Mine Railroad for the eleven
months of the year; whereas, in 1871, they
sent only 80,000 tons. At Mount Hope a large
excess is reported over the returns of last year.
The shipments of the Ogden Mine Railroad will
be about the same as in 1871. The ore tonnage
of the Morris and Essex Division of the Dela-
ware, Lackawanna and Western Railroad is 404,
832 tons, while that of 1871 was only 232,966—
being nearly one hundred per cent. increase.
More than four-fifths of this is the product of
the mines of this county.The completion of the New Jersey Midland
Railway has given a new outlet to the mines of
parts of Sussex, Morris and Passaic counties,
and already several of them are sending their
ores over this road. The branch of this rail-
road which is now being constructed in the
valley of the Ringwood creek and along Green-
wood Lake traverses a district particularly
promising, and affords an easy outlet for the
rich and extensive ore deposits of Ringwood.
Some recent discoveries of large ore outcrops
near this new line are reported, so that its pros-
pective tonnage is large, and the addition of the
product of this portion of the State to the
aggregate of all our mines may be equal to that
contributed by the most extensively worked of
the old localities or districts. When it is con-
sidered that only one-seventh of the surface of
the Highland range lying north of the Morris
and Essex Railroad is cleared land, and that,
hitherto, small deviations of the compass (or,
light attractions) have been regarded as un-
worthy of further attention or testing, and that
ore when found has been of little more value
than so much rock from the adjacent strata in
consequence of a lack of cheap transportation,
it becomes apparent that the mineral wealth of
this portion of the State is comparatively un-
known, and that there is a field for all inter-
ested in the development of its natural resources,
or in the mining of iron ore.In Warren county there has been a great deal
of prospecting in the way of surface opera-
tions, especially in the vicinity of Hacketts-
town, and thence southward toward Washing-
ton; but, thus far, they have not yielded any
very definite results. Ore has been uncovered
in many places, but in most instances it has
been found as a constituent mineral of granitic
and syenitic dykes—more rarely in gneissic
strata. Much searching with the dipping
needle has been over such ore-bearing rock,
and in some cases it has misled explorers. And
in this connection it may be stated that while
such rock masses may be closely related to ore
beds, the probabilities of their leading to such
beds or veins are not strong enough to justify
much labor or expense in the search after them.
This geological feature is not confined to this
portion of Warren county here mentioned,
since it can be seen at many points in the gneissic
rock formation. But there is a marked distinc-
tion between this mode of occurrence and that
of the regular ore beds, or veins, as they are
commonly called. These latter have definite
and well marked walls of rock, and the ore-
masses conform to the strata of the rock. The
dykes may be conformable to the adjacent beds,
but, generally, they are not so, sometimes cut-
ting across the strata. In nearly all cases they
are true veins, or dykes, and the distinction be-
tween them and the beds of ore, or veins as the
term is commonly employed, should be more
frequently borne in mind by all engaged in such
searches, as attention to this phenomenon will
save both time and money.West and southwest of Hackettstown, along
the east side of Jenny Jump mountain, the
mines opened two years ago have yielded large-
ly, and new outcrops have added to the reputa-
tion of this newly discovered ore belt. The
Pequest and Kishpaugh mines have been vigor-
ously worked, and have demonstrated the ex-
istence of large and profitable veins where the
surface indications were slight, and were for a
long time overlooked as not sufficiently marked
to warrant any further exploration. Near the
northeast end of this mountain range several
veins have been discovered on the Howell farm.
This lies west of the Johnsonburg road, and
between it and the Great Meadows. The dig-
gings are on a white limestone ridge near its
northern end. This limestone is mixed with
granite, staurolite, and other yet undetermined
rock species, the relations of which are not
fully understood. The Shaw mine, mentioned
in "The Geology of New Jersey," is about a
quarter of a mile southwest of this Howell
farm mine. The ore obtained here is of a su-
perior quality, containing a notable percentage
of manganese, some carbonates of lime and
magnesia, and very little phosphorus and sul-
phur. The limestone is mixed with the ore,
but not so largely as to greatly reduce the
percentage of metallic iron, which is 58.5 per
cent.Between this and the Kishpaugh mine, ore
has been found at a number of points, but the
localities are not yet sufficiently developed to
require any further notice. Apparently on this
same long line of outcrop is what is termed
the Redell mine, about a mile and a half north-west of Oxford. Here the crystalline lime-
stone is but a few rods from the ore, and
this, too, contains manganese. So that these
outcrops may be said to be characterized
by the presence of manganese and their
association with crystalline limestone. To-
ward the northeast a manganeseiferous iron
ore occurs at the mine worked some years
ago by the Glendon Iron Company, and
hence known as the Glendon mine. This is
about two miles southwest of Andover. Near
the latter village is the noted Andover mine,
and a little further eastward is the Roseville
mine, at both of which the same association of
minerals may be observed. Still further to the
northeast are the iron mines at Franklin Fur-
nace. Corresponding with this line of ore out-
crop, is the longer line of white, or crys-
talline, limestone, extending from Mounts Eve
and Adam, in Orange county, New York, to
Marble mountain at the Delaware River, and
skirting the northwest border of the Aztec for-
mation throughout its whole length. The age
of this limestone, and the rocks of this north-
west border, as compared with those of the
Highland range further to the east and south-
east, is unsettled. Whatever it may be, the as-
sociation of this ore with the limestone, and the
almost universal presence of manganese, are
remarkable, and indicate the possibility of find-
ing some order in the distribution of the iron
ore beds throughout the gneiss-rock formation
of our State.It is impossible at this time to get sufficient
returns of the ore carried by the railroad and
canal lines from stations within the State, and
so to get at the total product of the iron ore
district; but from data received from some of
the companies, and from estimates by those
well acquainted with the mining operations of
the State, the aggregate amount for 1872 may
be put at 600,000 tons. At five dollars per ton,
this would give \$3,000,000 as its value at the
mines. As compared with the other States of
the Union, New Jersey stands fourth, being ex-
ceeded by Pennsylvania, New York and Michi-
gan. And yet, as large as this may appear, it
is considerably less than the present capacity of
the mines as now working, and far below what
might be done under more comprehensive
plans, which would result from more extended
examinations as to the extent of the veins, or
which would follow from the consolidation of
interests or a co-operation in mining opera-
tions. In many instances these could be very
much simplified and the capacity of a vein
greatly increased by uniting the management.
The heavier the interests the more work in the
way of exploration becomes possible, and then
follows, as a natural sequence, the adoption of
more comprehensive and economical modes of
mining. In view of these facts, and the prob-
able constancy of the large veins even beyond
workable depths, the acquisition of mine prop-
erty and the consolidation of interests is a
subject that should attract the attention of cap-
italists, more particularly in these days of high
priced iron. And as a matter which favors the
development of our resources, it is here recom-
mended as worthy of consideration.**HEMATITES.**The total product of the hematite mines of
the State is greater than it was in 1871, but the
localities where such ore has been mined are
the same as given in the annual report of that
year. In Sussex county, the Pochuck, Cedar
Hill and Edsall mines have been worked a part
of the year. At the Pochuck mine a tunnel is
being driven through the narrow ridge east of
the old openings, so as to afford an easier and
more expeditious mode of getting the ore to
the railroad. The workings are under ground,
and the deposit resembles that of some of our
magnetic iron ore beds in its gneissic rock
walls, which dip at a high angle toward the
southeast. The recently opened Cedar Hill
mine is a short distance northeast from the
old mine, and on the east side of the ridge.
Here the rock, west of the ore, is the white
crystalline limestone which forms the mass of
the ridge, while under the ore, on the south-
east, a silicious conglomerate, consisting of
white quartz pebbles in a grayish matrix, also
silicious, crops out. Further work will show the
true relations of these rocks and the ore at
this interesting locality. Both of these mines
are owned and worked by the Franklin Iron
Company. The early completion of their large
blast furnace during the coming year will cre-
ate a demand for the ore of these mines, and
stimulate the search for additional sources of
supply.The hematite mines near Beattystown, in
Warren county, have been idle most of the
year. Quite recently they have come into the
possession of the Musconetcong Iron Works,
and a more vigorous working of this deposit
may be expected in the future. South of the
property held by these companies, and on ad-
joining farms, this ore has been found in work-
able quantities. These discoveries, with the
results of borings made on the lands of the
companies above mentioned, indicate an exten-
sive bed or deposit of ore. It lies between the
outcrops of the limestone and the slate, and
deeper excavations will no doubt show that it
rests upon the limestone. From these mine
holes, southward as far as Pennwell, in the deep
valley of the Musconetcong creek, hematite
has been found at intervals both in trial pits
and in the surface stratum, but, so far, not in
sufficient amounts to lead to any mining opera-
tions. These occasional appearances indicate
the existence of larger bodies or deposits in the
neighborhood, although some of them may be
of diluvial origin—that is, boulders and boulder
masses.In the Pohatcong valley, near New Village,
there is a hematite locality near the site of
some old diggings for this ore. The Carpenter-
ville mine, near the Delaware river at Carpen-
terville, is the only deposit of this ore in that
part of the county which is worked.

In the last annual report reference was made

to a discovery of hematite in German Valley,
near the Hunterdon county line. During the
past season the localities were twice visited,
and the following data collected: The explora-
tions were made under the superintendence of
Isaac Hummer for J. Taylor & Co., of High
Bridge. They were confined to the central and
eastern portions of the valley, close to the pub-
lic road which runs northward from California
into Morris county, and at the foot of the Fox
Hill range. The mode of search was by test
pits or wells sunk in the overlying earth, mixed
clay, and ore deposits, from fifteen to forty feet
deep, and having a diameter of from two and a
half to three feet. A pick and a spade, with
handles about a foot long, were the only tools
necessary in digging in so narrow a space. The
hoisting of the materials was in buckets hold-
ing about fifty pounds of dirt each, and was
done by the aid of a windlass made so light as
to be easily moved from pit to pit by a couple
of men. With these helps two men were able
to do all the work. The cost of digging these
pits, aside from the tools and hoisting gear
which were furnished the laborers, was twenty-
five cents per vertical foot. And here it may be
stated that in the Lehigh Valley the contrac-
tor for digging such pits or wells, two and a half
to three feet in diameter and up to fifty feet in
depth, ranges from fifteen to twenty-five cents
per foot, being more expensive the greater the
depth. At this apparently low cost laborers
make good wages, an experienced man being
able, under favoring circumstances, to go down
twenty feet in a day. Such an easy, and, com-
paratively, inexpensive mode of search is ad-
mirably adapted to explorations for hematites,
ochres, clays, or other earthy materials where
there is no solid rock or indurated earth to be
encountered, and is here recommended to all
desirous of testing ground for such minerals.
In German Valley about a hundred such holes
were sunk, and in most of them ore was found.
A few on the upper or eastern side of the road
struck the gneiss only a few feet beneath the
surface. One west of the stream, and in the
valley flat, sunk to a depth of forty feet, was in
blue limestone, after passing through the cover-
ing of earth. The ore found in these holes was
in small masses or concretions, mixed with yel-
lowish earth and a white sandy clay, such as gen-
erally accompanies hematite. All the holes in
which it was found stopped in it, one of them
showing a thickness of twenty-five feet of ore.
From these explorations it appears probable that
the ore occurs in a bed or deposit quite narrow,
but extending for some distance lengthwise the
valley near the western base of the gneissic
ridge. At present, the nearest railroad to this
ore deposit is at Chester, seven miles away, in
a direct line. High Bridge is about the same
distance, or a very little further. With a rail-
road traversing the valley and connecting these
points this deposit would, according to present
prospects, yield largely. And here the state-
ment of the report for 1871, in regard to the oc-
currence of hematites, may be repeated, viz:
"As ore is most generally found near the borders
of the limestone outcrop, either between the
gneiss (or gray rock) of the bounding ridges and
the limestone, or between the latter rock and
the overlying slate, searches should be confined
more particularly to such lines of outcrop.
Explorations should, however, extend over the
whole breadth of these valleys, as it is some-
times found resting upon the limestone strata,
covered by quite thick beds of ferruginous
loam, clay, or other earthy matter." And in
such searches recourse may often be had to
boring instead of digging. This is much quicker
and cheaper, and preferable in not disturbing so
much of the soil or any crop growing upon the
ground. Stony strata, or those containing cob-
ble-stone or large boulders, cannot be readily
penetrated by an auger, but such stony beds
are not common over hematites, or, if so, they
constitute a thin, superficial, drift layer, and, in
such cases, the boring could be started after a
pit has been sunk through this top stratum.
Generally, the covering consists of earthy beds,
containing much clay, and an auger can easily
be driven through these materials.The increasing demand for iron ores will un-
doubtedly lead to the examination of much
ground hitherto unnoticed, and to the discov-
ery of additional localities where hematite may
be obtained in workable quantities. And the
great extent of magnesian limestone outcrops
in the valleys of Warren and Sussex counties
offers a wide field for such discoveries. In all
cases due attention to the character of the sur-
face is necessary, as the presence of loose pieces
of float ore in the soil is one of the first features
to be determined before the digging of trial-pits
or boring is attempted.**ZINC ORES.**The mines at Stirling and Mine Hills, in Sus-
sex county, continue to yield an abundant sup-
ply of rich zinc ore. As the working of these
mines goes forward, the extraordinary size of
the veins is more and more apparent, and there
is probably no other place in the world where
so large an exposure of zinc ore can be seen as
at these mines at the present time.A Chinese mandarin, named Yung Wing, has
been visiting Philadelphia, having recently suc-
ceeded in obtaining the approval of the Im-
perial government of a plan he has conceived
for the introduction of iron manufactures into
China, and the object of his visit to Philadel-
phia was to inquire into American methods and
processes. China is rich in deposits of iron ore,
and both anthracite and bituminous coal, but the
Imperial government has thus far not permitted
their development. Nor is there a single rail-
road in China. Yung Wing entertains strong
hopes that an era of industrial development is
about to dawn upon his country.The coal operators at Youngstown and vicin-
ity are introducing negroes from Richmond,
Va., to take the places of the white miners who
are on a strike.

Iron.

**Atwater, Wheeler
& Co.,**

New Haven, Conn.,

IRON MERCHANTS

AND

Manufacturers.

Manufacture in their New Haven Mill, or import through their Liverpool House, all grades of

Merchant Iron

ALSO

**Scrap Iron,
Wire Rods,
Tin Plate, &c.**

And invite correspondence with close buyers in all parts of the country.

Freight from New Haven to all points West and South same as from New York.

CLEVELAND.

Cleveland Rolling Mill Company.

MANUFACTURERS OF

BESSEMER STEEL RAILS,

Steel Plates and Forgings, Railroad Iron, Merchant Bar, Beams, Girders, Splices, Bolts, Spikes, &c., &c. Office, Nos. 99 & 101 Water St., CLEVELAND, O. A. T. STONE, Pres. H. CHISHOLM, V. P. & Gen. Supt. E. S. PAGE, Sec'y.

Cleveland, Brown & Co.

IMPORTERS, MANUFACTURERS AND DEALERS IN

IRON AND STEEL,

HORSE SHOES, HORSE NAILS, NORWAY NAIL RODS, NAILS, SPIKES, "Standard Taper" Axles & Swedes Iron, WINDOW GLASS.

Wrought Iron Pipe and Boiler Tubes Chains, Rivets, Nuts, Washers, and Heavy Hardware Generally. 25, 27, 29 & 31 Merwin Street, CLEVELAND, OHIO.

ENTERPRISE IRON WORKS.**Cartwright, McCurdy & Co.**

MANUFACTURERS OF

Cotton Tie, Trunk & Woodenware

HOOP IRON,

Band, Scroll and Bar Iron.

General Office & Warehouse, CLEVELAND, O. Works at Youngstown, O.

Niles Iron Co.,

Manufacturers of

**Bar & Sheet Iron,
NILES, OHIO.**

L. C. ANDREWS, President.
L. E. COCHRAN, Sec'y. & Treas.
S. E. BROWN, Gen'l Supt.

OLD DOMINION

Iron and Nail Works Company,
RICHMOND, VA.,

R. E. BLANKENSHIP, Commercial Agent,
Manufacture

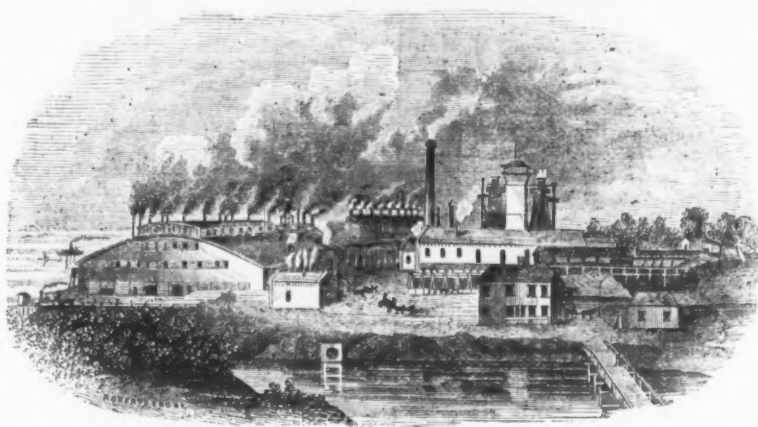
NAILS AND BAR IRON.

Bands, Scrolls, Horse Shoe Bars, Nut and Rivet Iron, Spike Rods, Shafting, Bridge bolts, Ovals, Half Ovals, Half Rounds, &c.

Iron.

MILWAUKEE IRON CO.,

MANUFACTURERS OF

**RAILROAD IRON**

of Unsurpassed Excellence.

Capacity of Works, 45,000 Tons of Rails per Annum.

E. B. WARD, Pres. ALEX. MITCHELL, Treas. J. J. HAGERMAN, Sec'y. & Agent.

MILWAUKEE, WI.

PHILADELPHIA.

**Iron and Steel T and
Street Rails**

Of Best American and English Makes.
CHAIRS, SPIKES, FISH BARS,
RAILROAD SUPPLIES.

Muck Bars, OLD RAILS, Scrap,
BLOOMS.

American and Scotch
PIG IRON, AND METALS.

CHAS. W. MATTHEWS,
133 Walnut St., Phila.
[Late RALSTON & MATTHEWS, 133 Walnut St.]

**MALIN BROS.,
IRON**

Commission Merchants,
No. 228 Dock Street,
3d door below Walnut, PHILADELPHIA.

**BLAKISTON & COX,
IRON**

Commission Merchants,
No. 333 Walnut Street,
PHILADELPHIA.

**CAMBRIA
IRON COMPANY,
JOHNSTOWN, PA.**

This Company, by mining the raw materials and manufacturing the pig metal from a mixture of the most suitable ores in their own blast furnaces, situated on both sides of the Alleghany mountains, are enabled to obtain the various kinds of iron best adapted for the different parts of a rail. Their own machine work and repairs, and rolling the rail way bars with the latest improved machinery they produce

RAILS

of an unsurpassed excellence of quality at the lowest market rates. The long experience of the present managers of the Company, and the enviable reputation they have established for "CAMBRIA RAILS," are deemed a sufficient guarantee that purchasers can, at all times, depend upon receiving rails unsurpassed for strength and wear by any others of American or foreign make. Any of the usual patterns of iron rails can be supplied on short notice, and new patterns of desirable weight or design will be made to order. The Company are also preparing to manufacture Steel Rails by the Pneumatic process. Address

CAMBRIA IRON COMPANY
218 S. Fourth St., PHILADELPHIA
or at the works, JOHNSTOWN, PA.

S. FULTON & CO.,

MANUFACTURERS OF
Pig Iron and Cast Iron Gas and Water Pipes.
ALSO HEAVY AND LIGHT CASTINGS
OF EVERY DESCRIPTION.

PLYMOUTH IRON WORKS, CONSHOHOCKEN, PA.
Office, No. 412 Walnut St., Phila.
SAMUEL FULTON. THEO. TREWENDE

**DANIEL L. TOWER,
Malleable & Gray Iron
Castings,**

ELIZABETHPORT, N. J.
Malleable Iron Castings, either from Cupola or Air
Furnaces.
N. Y. Office, 30 Cortlandt Street.

PHILADELPHIA.

The Phoenix Iron Co.,

410 Walnut St., Philadelphia.

MANUFACTURERS OF

CURVED, STRAIGHT AND HIPPED
Wrought Iron Roof Trusses

BEAMS, GIRDERS, AND JOISTS,
and all kinds of Iron Framing used in the construction
of Iron Proof Buildings.

Deck Beams, Channel, Angle
and T Bars

curved to template, largely used in the construction
of Iron Vessels.

Pat. Wrought Iron Columns, Weldless
Eye Bars,

for Top and Bottom Chords of Bridges.

Railroad Iron, Street Rails, Rail Joints and
Wrought Iron Chairs.

Refined Bar, Shafting, and every variety of
Shape Iron made to order.

Plans and Specifications furnished. Ad-
dress

SAMUEL J. REEVES Vice Pres.

George Buchanan.

(Established 1853.)

Exporter of

OLD RAILS

IRON AND STEEL RAILS, PIG IRON,
Machinery of every description.
19 BIRCHIN LANE, LONDON, ENGLAND.
Bankers—Messrs. Barclay, Bevan, Tritton,
Twells & Co., 54 Lombard Street, London.

John E. Swan & Brothers,
Exporters of

Scotch & English Pig Iron,
Glasgow & Middlesbrough.

ELIZABETH IRON CO.

MANUFACTURERS OF

Merchant Bars
and Fish Plates,
ELIZABETHPORT, N. J.
E. M. DUNN, Supt. & Treas.

Artistic & Enduring**MONUMENTS,**

IN GRANITE AND BRONZE

designs submitted by Mail.
National Fine Art Foundry
218 East 25th Street, New York.

R. D. WOOD & CO.,
PHILADELPHIA.
Manufacturers of
Cast Iron Water and Gas Pipe,
Lamp Posts, Retorts, &c.

Also, Race & Mathews' Patent Hydrant. This Hy-
drant is perfectly anti-freezing, is the most ornamental
and the cheapest made.
R. PAINE, Selling Agent,
Office, 115 Broadway, N. Y.

Iron.

CAST IRON FLANGE PIPESOf any length or diameter, for Steam Engines, Exhaust Steam, Fire Purposes, Refineries,
both Faced and Drilled and Plain. Also,**GAS and WATER PIPES**

Of all sizes, with necessary connections for

LAMP POSTS, FIRE HYDRANTS,
VALVES, &c.

R. A. BRICK & CO., Mfrs., 89 White St., N. Y.

METALS.**THOMAS J. POPE & BRO.,**

292 Pearl Street, NEW YORK,

PIG IRON—Scotch and American,

Ingot Copper, Spelter, Nickel,

AND METALS GENERALLY.

OLD RAILS, SCRAP IRON, &c

Consignments Solicited on fair Advances.

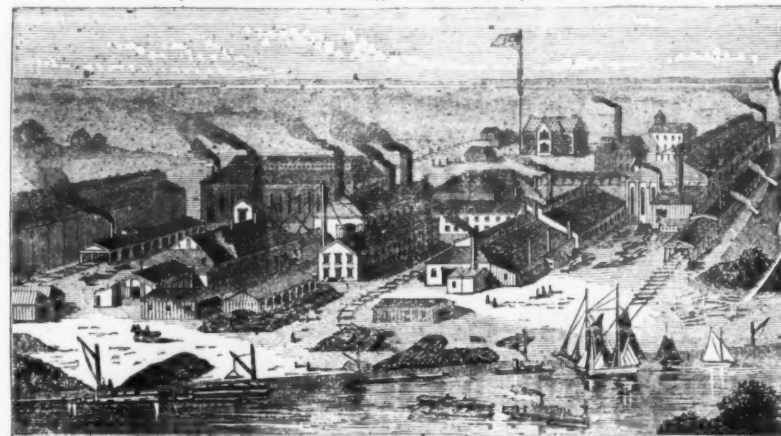
JESSE W. STARR.

BENJ. A. STARR

BENJ. F. ARCHER.

CAMDEN IRON WORKS

(Established 1824), CAMDEN, N. J.

**JESSE W. STARR & SONS,**

Engineers, Contractors and Manufacturers of Gas Apparatus.

And all the

Buildings, Tanks, Holders, &c., required for the Manufacture, Purification, and Storage

of Gas, and Street Mains Requisite for its Distribution.

Plans, Drawings, and Specifications promptly furnished.

IRON FOUNDERS.

CAST IRON STREET MAINS, for Water and Gas, from One and a Half Inches to

FORTY-EIGHT Inches in Diameter.

Stop Valves (all sizes), FIRE HYDRANTS, HEATING PIPES, BRANCHES, BENDS, TEES

CASTINGS of any form or size required.

PHILADELPHIA OFFICE, - - 403 WALNUT STREET.

JOLIET IRON & STEEL CO.

Joliet, Ills.,

MANUFACTURERS OF

**PIG METAL, RAILROAD IRON,
And Bessemer Steel Rails.**

Office, 94 Washington Street, CHICAGO.

A. B. MEEKER, President.

J. H. WRENN, Sec'y and Treas.

TAYLOR IRON WORKS,

HIGH BRIDGE, N. J.,

On the line of the Central Railroad of New Jersey.

CAR WHEELS, CAR AXLES,

DRAW HOOKS & FORGINGS.

LEWIS H. TAYLOR, President.
W. J. TAYLOR, Treas. & Gen. Man., S. P. HADDER, Supt.
JAS. H. WALKER, Secretary, EDWD L. BROWN, General Agent.
New York Office, 93 Liberty St.

ATKINS BROTHERS,

PROPRIETORS OF THE

Pottsville Rolling Mills & Pioneer Furnaces

POTTSVILLE, PENNSYLVANIA.

Having introduced New and Improved Machinery into their Rolling Mills, and manufacturing all their
iron from the ore, and also doing all Machine Work and Repairs in their own shops, they are enabled to
produce

RAILROAD IRON

Of uniform quality, unsurpassed for strength and wear, and of any required length.

Address the Proprietors, Pottsville, Pa.

**The Britannia Ironworks Company, Limited,
Middlesbro' England,**

MANUFACTURERS OF

ALL DESCRIPTIONS OF IRON RAILS,

Surplus Stocks of Various Sections always on hand.

London Office: W. G. FOSSICK, 6 Laurence Pountney Hill, E. C.

Weekly Output, One Thousand Tons.

**NEW HAVEN
Rolling Mill Comp'y**

Manufacturers of Merchant, Horse Shoe, and extra
quality Iron. Guaranteed to stand specified tests.
Special orders taken for common Iron.
New Haven, CONN.

BONNELL, BOTSFORD & CO.,

Youngstown, O., Wholesale Dealers in

Bar, Boiler, Hoop & Sheet Iron,

NAILS and SPIKES,

Gas Pipe, Nuts and Washers, Carriage Bolts,
Swedes Iron, Cast Steel, Spring Steel, &c.

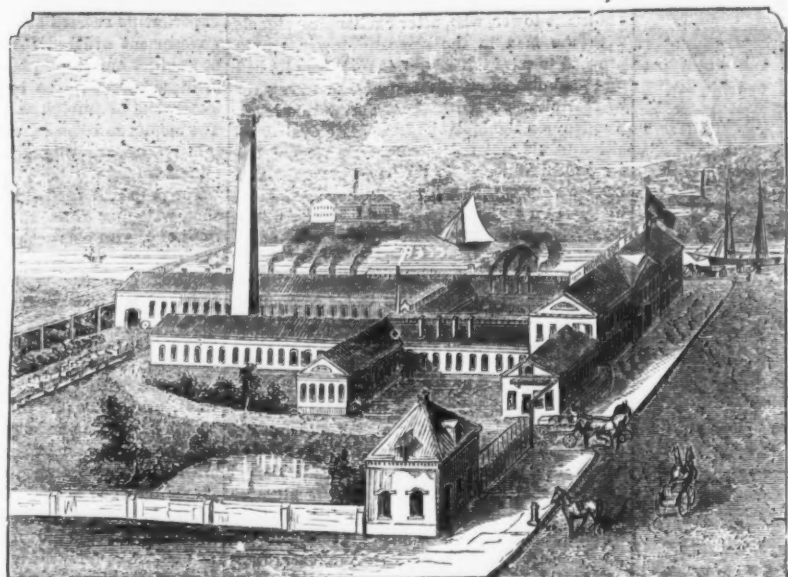
NICHOLSON FILE CO.,

PROVIDENCE, R. I.,

INCORPORATED 1864.

TAPER FILES

And all other kinds below 6 inches
IN BOXES OF ONE DOZEN EACH.



Every File Warranted.

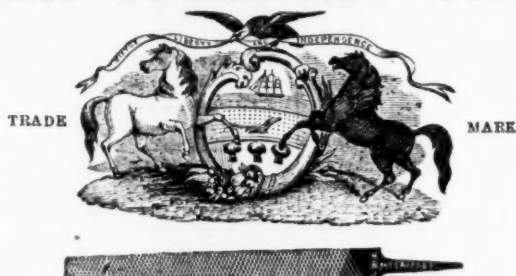
THE NICHOLSON FILE.

All Nicholson Files are cut with the Patent Increment Cut, an invention owned and controlled exclusively by us, the file cut in this manner being Patented as a new article of manufacture, and differs from all other machine cut files (all of which have their teeth cut with equal spaces) by being cut with teeth slightly expanding or increasing in size and space from the point, thus avoiding the too great regularity of teeth common to all other machine cut files. The tendency of all cutting tools with teeth or cutters placed at regular distances from each other may be illustrated (to the machinist at least) by the fluted reamer—as it is well known that if a round reamer be made with (say 12) teeth whose spaces are equidistant, the hole reamed will not be round and smooth, but will approximate to a hexagon in shape. Whereas, if the same number of teeth be made of irregular distances, the hole reamed will be both round and smooth. The same is true of a file, hence the necessity of its having teeth at unequal distances, and to which we have applied the name of Increment Cut File, which possesses all the advantages of hand cut work, and the accuracy and uniformity of machine work. It is now upwards of six years since this File was introduced to the public, and the demand has increased until our production is undoubtedly treble that of any File manufactory in the country.

Our prices are as low as it is possible to furnish a really first-class File from the best of File Steel, and may be had, with full terms and conditions, by addressing the

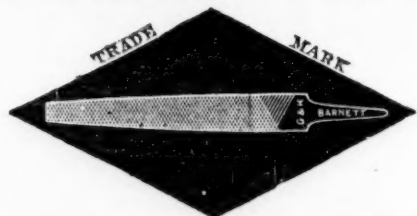
NICHOLSON FILE COMPANY,
Providence, R. I.

PENNSYLVANIA FILE WORKS.



McCAFFREY & BROTHER,
Manufacturers of FIRST QUALITY FILES and RASPS ONLY,
Nos. 1732 & 1734 North Fourth Street, Philadelphia, Pa.

Black Diamond File Works.



G. & H. BARNETT, 39 41 & 43 Richmond St. Phila.

TURNER, SEYMOUR & JUDDS.

MANUFACTURERS, IMPORTERS AND DEALERS IN

Hardware and Upholsterers' Brass Goods.

SOLE AGENTS FOR

L. L. Davis' Patent Levels, Stevens' Calipers and Dividers,
Page's Auxiliary Jaws.

Manufacturers of J. H. P. P. and Combination Patent Curtain Fixtures, Locks and Curtains' Patent
Rising Steel, Patent Twine Boxes, Picture Nails and Hooks, Escutcheon Pins, Coat and Hat Hooks; also
Miscellaneous Iron and Brass Goods.

Small Brass and Iron Castings made to order.
64 Duane Street, NEW YORK.

FERNALD & SISE,

After May 1st, 1873,

No. 100 Chambers St., N. Y.

WILLIAMS WHITE & CHURCHILL,

Successors to

MACKRELL & RICHARDSON MFG. COMPANY,
Manufacturers of

Builders' Hardware,

Locks, Hinges, Hooks and Staples,
Awning Hooks, Meat Hooks, Pincers,
Champion Noiseless Pulleys,
CHAIN PULLEYS, &c.

Factory, cor. Flushing and Nostrand Avenues,
BROOKLYN.

Warehouse, 73 Warren St., N. Y.

OSCAR BARNETT, Hardware & Machinery

Gray Iron Foundries & Machine Works
Hamilton, McWhorter and Bruen Streets.

Malleable Iron Works,

N. J. R. Avenue, corner Johnson Street
Store—34 and 36 McWhorter Street,
NEWARK, N.

Malleable Iron Castings, from AIR FURNACE or Cupola, furnished to order.

Small Gray Iron Castings, soft and smooth.
Brass Moulders' Flasks, Cabinet and Coach
Makers' Clamps
ESTABLISHED 1815. P. O. Box 122.



Putnam's Government Standard
FORGED

HORSE SHOE NAILS.

Manufactured from the best of NORWAY Iron,
and warranted to give entire satisfaction.

S. S. PUTNAM & CO.,
NEPONSET, MASS.

L. A. SMITH,
NICKEL PLATER,

LICENSED BY

UNITED NICKEL CO. OF NEW YORK.

Premium Awarded by the N. J. State Fair,

42 Mechanic St., NEWARK, N. J.

ANE, GALE & CO

SOLE AGENTS

FOR

TROY WRO'T BUTT CO'S Wrought Iron Butts (Riveted Pin).

THE EAGLE SQUARE CO'S Steel and Iron Squares.

E. F. HURD'S AXES, HATCHETS, ADZES, &c., &c.

G. T. LANE'S PLANTERS' HOES.

AGENTS FOR

BURDEN'S HORSE and MULE SHOES.

E. W. GILMORE'S STRAP and T HINGES.

SCOVIL MFG. CO'S BRASS BUTTS.

J. M. KING'S STOCKS & DIES.

McCREA'S SHOE THREADS and TWINES.

G. F. ELLS' CURRY, CATTLE and PLANTATION CARDS

ENAMELED and TIN WARE, &c., &c., &c.

TROY, N. Y.

G. W. Bradley's Edge Tools.

Butchers' Cleavers,	Axes and Hatchets,
Bush Hooks, all patterns,	Grub, Garden & Planters' Hoes,
Furpentine Tools, all kinds,	Mill Picks, Mattocks & Picks
Coopers' Tools, a specialty,	Box Scrapers & Chisels,
Ship Carpenters' Tools,	Cotton Hooks & Samplers.

N. WEED. 37 Chambers St.

W. F. SHATTUCK & CO.,

113 Chambers and 95 Reade Street, New York.

MANUFACTURERS OF AMERICAN HARDWARE.

Cox & Taff's Pat. Wrenches,	Mouse Traps,	Wire Selves,	Yan's Cow Bells,
Axe, Pick, Sledge & Hammer	Scale Beams,	Patent Tap Borers,	Axes, Picks and Hatchets,
Handles,	Patent Chests,	Chimney Horse Collars,	Hammer, Crow Bars,
Hatchet, Auger, Chisel & File	Chimney Horse Collars,	Brundage Horse Nails,	Sad Irons,
Handles,	Brundage Horse Nails,	Hazare's W't Iron Goods,	Boring Machines,
Mallets, Pat. Root Jacks,	Hazare's W't Iron Goods,	Shattuck's Platform Counter	Cast Iron Hatchets,
Chisels and Gimlet Bits,	Shattuck's Platform Counter	Scales,	Coffee Mills,
Augers and Auger Bits,			Star Steel Spoons,
Cocoa Nut Dippers,			Stocks and Dies.

P. & F. CORBIN,

MANUFACTURERS OF

VERY BEST QUALITY

SOLID BRONZE HARDWARE,

For Trimming Dwelling Houses, Stores and Public

Buildings, consisting of

**Butts, Door Knobs, Locks, Bolts, Store
Door Handles, &c.**

ALSO, A FULL LINE OF

Regular Builders' & Miscellaneous Hardware.

Warehouse, 87 Chambers & 69 Reade Sts., N. Y.

FACTORY, NEW BRITAIN, CONN.

LLOYD, SUPPLEE & WALTON,

WHOLESALE

HARDWARE HOUSE,

AND

HARDWARE FACTORS.

BATES' MANUFACTURING CO'S GOODS.

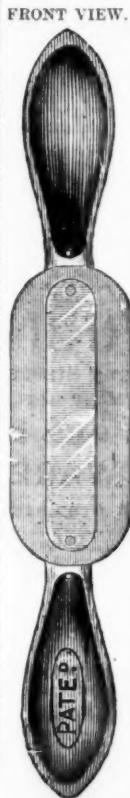
Bonney's Pat. Hollow Augers & Spoke Trimmers.

Bonney's Patent Double-Edged Spoke Shave.

Bonney's Patent Adjustable Gate Hinge.

Bonney's Patent Sash-Fast and Lamp Bracket.

625 Market Street,
PHILADELPHIA.



L. L. & J. T. SMITH,

Successors to L. L. SMITH & CO.,

NICKEL PLATERS,

133 & 135 West 25th St.,
Between 6th & 7th Avenues, NEW YORK.

TACKLE BLOCKS.

BURR & CO.

Manufacturers of Waterman and Russell's

PATENT IRON STRAPPED BLOCKS,
ALSO, MANUFACTURERS OF
ROPE STRAPPED BLOCKS,
51 PECK SLIP, NEW YORK.

THE ARCTIC FREEZER.

SIMPLEST.



QUICKEST.

BEST.

Send for Price List.

E. S. & J. TORREY,

166 Fulton Street, New York,

JAMES C. HAND & CO.,
COMMISSION MERCHANTS,

No. 614 & 616 Market Street, PHILADELPHIA.

AGENTS FOR:

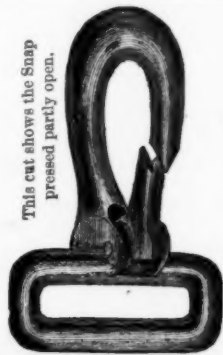
William Penn, Reading and Norristown Pig Iron.
Reading Iron Co.'s (Crescent Brand) Nails, Boiler Flues, &c.
Bar Iron, Plow Steel and Iron, South Easton Iron Wire.
Wm. Jessop & Sons' Steel and Norway Nail Rods.
Barrows, Savery & Co.'s Hollow Ware. Castings, &c.
Fisher & Norris' "Eagle" Anvils and Vises.
Washington Mills Emery.
Heavy Hardware, &c., &c.

MIDDLETOWN TOOL CO.,
MIDDLETOWN, CONN.,

MANUFACTURERS OF

The Celebrated "Baldwin" Plane Iron,
HENSHAW'S PATENT HARNESS SNAPS
GERMAN HARNESS SNAPS,

PAT. GAFF TOP-SAIL SELF-MOUSING SHIP HOOKS,
Plow, Filletster & Dado Stops of all kinds, Set Screws for
Plows, Bench Plane Starts, &c. Patent Washer Cutters. Plane
Iron Screws to order of any size.
Send for Illustrated Catalogue and Price List.

This cut shows the Snap
pressed partly open.

Something New for
OTIS FURNACES & MINES.
New Union Steam Safety Elevator,

How One Works.

RIVERSIDE IRON WORKS, DEWEY, VANCE & CO.,
Wheeling, W. Va., January 14th, 1873.

Dear Sirs: The experience of a year proves that your *Furnace Elevator* is superior to all others in use. We have in the six weeks from December 1st to Sunday last, 12th inst., made 2724 tons, 1401 lbs. Pig Metal, or an average of near 65 tons per day, which required the elevator to lift 72 feet high 4 1/2 tons Ore, Coke and Limestone for each ton of metal produced, or more than 11,500 tons material in the 6 weeks. The largest yield in one day was 81 1/4 tons Iron, involving the lifting of 345 tons material in 24 hours. This has all been done to our satisfaction, and that, too, in the coldest weather we have had. Other furnaces with water and pneumatic hoists have experienced great difficulty, on account of the water freezing in the tanks; and in the case of the air hoists, we understand that two furnaces, not far from us, had to "blow out," from being unable to hoist stock during the "cold snap." The difficulty, we are told, was caused by the condensed moisture in the blast freezing to the sides of the cylinders, so that the piston could not move up or down. Very truly, yours,
DEWEY, VANCE & CO.

Send for Circular to

OTIS BROTHERS & CO.,
348 Broadway, NEW YORK.

Biddle Manufacturing Co.,

FINE TOOLS

AND

Hardware Specialties.

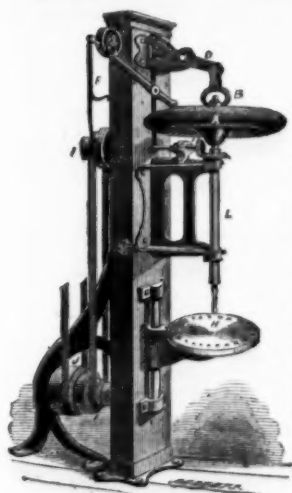
We call the attention of Carriage Makers,
Machinists, Iron Rolling Manufactur-
ers, Blacksmiths, and
all others interested in Drill-
ing, Punching or Cutting
Iron, to our

Improved Drill Press,
Shear and Punch,

feeling assured that upon examina-
tion their merits must be apparent
to every one, from the fact that they
possess the essential characteristics
of strength, power and cheapness,
in a high degree.

Illustrated Catalogues and Price
Lists furnished on application.

We are also prepared to furnish
light work of any description and in any quantity to order.



All kinds of Die Forgings promptly attended to.
OFFICE & WAREHOUSES, 78 Chambers Street, New York.



THE TRAVELERS INSURANCE COMPANY, OF HARTFORD, CONN.

THE TRAVELERS is the only com-
pany in America writing yearly or
monthly policies of insurance against
general accidents.

TRAVELERS INSURANCE CO.

THE TRAVELERS has written upwards
of 270,000 general accident policies,
of which 32,418 were written last
year.

TRAVELERS INSURANCE CO.

THE TRAVELERS insures men of all
trades, occupations and professions,
between the ages of 18 and 65, at a
yearly cost of \$5 to \$10 per
\$1000, for risks not specially hazard-
ous.

TRAVELERS INSURANCE CO.

In these days of accidents, every busi-
ness man, working man, profes-
sional man, or any other man, should
have an accident policy. It can
be procured at a little trouble and
small cost. Apply to any Agent,
or write to the company, at Hart-
ford.

TRAVELERS INSURANCE CO.

THE TRAVELERS also grants all forms
of full Life and Endowment Insur-
ance, and offers peculiar induce-
ments in its sensible all-cash plan,
its definite, straight-forward con-
tract, its ample security, its low
premiums, and its good manage-
ment.

TRAVELERS INSURANCE CO.

THE TRAVELERS has paid over Two
Millions cash in direct benefits to
policy-holders, for death or injury,
disbursing among 16,710 claimants
a sum averaging SEVEN HUNDRED
AND FIFTY DOLLARS A DAY for
every working day since the com-
pany began business.

TRAVELERS INSURANCE CO.

THE TRAVELERS has Cash Assets of
\$2,259,945.48, affording a net sur-
plus, as to policy-holders, over and
above re-insurance reserve and all
liabilities, of \$705,371.58.

J. G. BATTERSON, President.
RODNEY DENNIS, Secretary.
CHAS. E. WILSON, Asst. Sec'y.
GEO. B. LESTER, Actuary.

BUSINESS ITEMS.

PENNSYLVANIA.

The Glendon Iron Company's works, at Glen-
don, consumes 100,000 tons of ore yearly,
85,000 tons of coal and 50,000 tons of limestone.
The company have a capital of over \$1,000,000,
employ 450 men, and disburse monthly, for
wages alone, \$50,000. The ores used are the
hematite of this locality and the magnetic of
New Jersey.

The new sheet mill at Easton has a capacity
of about 35 tons per week.

The Allegheny Car and Transportation Com-
pany is the title of a corporation which has been
organized under a charter which authorizes it
to build, equip, rent or contract for cars, or
other railroad vehicles, and to sell, use or rent
the same to any person or corporation, or to
transport freight. Thus the company possesses
the franchises of a car manufacturing company,
a rolling stock company, with privilege to rent
its cars to railroad or transportation companies
and individuals, and a transportation company
or freight line. The capital stock is \$100,000,
which may be increased to \$500,000. About
\$80,000 has been already subscribed, and three
acres of ground have been purchased at Wil-
kinsburg, as a site for the car works. The erec-
tion of buildings will be commenced when the
season opens, and the entire establishment com-
pleted at an early day.

Lewis, Oliver & Phillips, at their Birmingham
works, use a large double steam punch, and
have lately been cutting from iron plate of
about No. 10 gauge, and at a single stroke of
the machine, a piece of about the area of 10x18
inches. This punching machine weighs about
31,000 pounds, and was made by Lewis & Ros-
siter. A similar punch was made for Spuyten
Duyvil Rolling Mill Company, of New York,
weighing 35,000 pounds. These machines have
their own engines, and in some cases they are
made to drive other machinery beside the
punch, of which they form a part.

The Huntingdon Journal states that but one
of the Greenwood furnaces is in blast. It yields
37 tons of charcoal iron per week. The other
will be put in blast about the middle of May.
300 men are now employed.

The National Locomotive Works of Dawson
& Bailey, at Connellsville, employ 120 men, and
turn out at the rate of two engines per month.

The Susquehanna Rolling Mill is undergoing
repairs.

Stewart & Co.'s wire mill, at South Easton,
is the largest in the United States. It was estab-
lished in 1836, for the manufacture of all sorts
and sizes of wire, from the hair thread to the
bridge cable. The mill has a capacity of about
40 tons per day. The capital is about \$250,000,
and nearly 300 hands are employed, the pay roll
being some \$25,000 per month.

Mechanicsburg has subscribed \$15,000 toward
a proposed car factory in that town.

Two new furnaces are in course of erection at
Cornwall, Lebanon county.

CONNECTICUT.

The Fitchville Manufacturing Co., at Bozrah,
will erect a large mill in addition to their pre-
sent workshop.

MASSACHUSETTS.

Messrs. Alger & Co., of South Boston, are
casting several fifteen-inch guns for the Argen-
tine republic, and the Watertown arsenal work-
men are manufacturing heavy sea-coast carriages
for the same government.

OHIO.

Carnes, Agerton & Co., Lima, manufacturers
of steam engines, boilers, circular saw mills,
&c., have been established since the year 1860.
Their foundry is 36x70 feet, blacksmith shop
15x28, machine shop 70x70, and two stories,
warehouse 35x70. They employ 60 men, and
use 120,000 lbs. of pig iron per year. They are
building from 30 to 40 complete engines and
saw mills per annum, and ship to various States.
They make a specialty of direct-acting circular
saw mills. All their work is warranted. They
are filling a large contract for castings for the
Dayton and Michigan Railroad.

The Cleveland Iron Company—George L. In-
gersoll, president, William Bingham, vice-presi-
dent, and S. A. Fuller, secretary and treasurer
—employ 500 men at an average of about \$2-50
per day in the manufacture of pig iron, railway
bars, merchant bar, spikes, splices, bolts and
nails. They use from 250 to 300 tons of coal
per day, and produce from 35 to 40 tons of pig
iron and from 80 to 100 tons of rails per day.
They use Lake Superior ore almost exclusively.
The Tropic Furnace Company, of Jackson
county, have completed their organization.
Ezekiel T. Jones is president, and Daniel D.
Morgan, secretary. Work on the new furnace
will be commenced at once.

NEW JERSEY.

The Watson Bridge Company, of Paterson,
are building 14 bridges for a railroad in Costa
Rica, Central America. Also one for Morris
county, to cross the Whippany River, to be
about 85 feet long, which will be finished in a
couple of weeks; also one for Newark, to cross
the Morris canal at Sussex avenue, to be 50 feet
long, and to cost about \$11,000; also one for
Jersey City, to cross the Morris canal, which
will cost \$20,000. On this bridge the floor is to
be laid on brick arches resting on iron beams,
and to be paved with Belgian pavement. One
of the Fourth avenue (New York) Improve-
ment bridges was completed last week. It is
600 feet long, and cost between \$35,000 and
\$40,000.

Beckwith's Iron Works, at Paterson, have
been materially enlarged recently.

The Warren Foundry, at Phillipsburg, makes
a specialty of the manufacture of water pipes,
which are sent to various parts of the United
States and South America. The company have
a capital of nearly \$300,000, employ 250 hands,
and pay for labor about \$26,000 per month.

The Andover Iron Company, at Phillipsburg,
with a capital of nearly \$1,000,000, have three
blast furnaces, which produce about 35,000

tons of pig iron per annum. They employ
400 men and pay for labor about \$35,000 per
month.

RHODE ISLAND.

Mr. Geo. W. Miller, Providence, has been en-
gaged in the manufacture of safes for the past
20 years, adding valuable improvements from
time to time, and the safes, as manufactured
to-day, enjoy a high reputation. The produc-
tion of the two factories, one in Providence and
one in Baltimore, Md., has for a long time ex-
ceeded 100 fire-proof safes per month, together
with large contracts on bank work. The new
treasury vaults at Washington were built by
these makers, and they have in process of con-
struction another vault for the government.
These safes have been severely tested in the re-
cent great fires, and the makers claim that not
a single safe was lost.

The Union Eyelet Company, of Providence,
is one of the largest concerns of the kind in the
United States. Their machinery is patented and
used by them exclusively. They manufacture
a large variety of eyelets, making a specialty
of shoe, suspender, bustle, corset, skirt and
tag eyelets, all of which are sold through their
agents, Messrs. Howard, Sanger & Co., 105
Chambers street, New York. Under the
personal management of Mr. Fred. A. Young,
secretary and treasurer of the company,
they are turning out a class of goods
second to none in the country. They will re-
move to their new and spacious factory on
Borden street, about April 15th.

Jewelers' tools of all kinds are manufactured
by Henry Blundell & Co., of Providence,
whose business was established in 1849. They
are now giving special attention to the manu-
facture of Barry's patent piston and rod steam
packing, of which they own the exclusive right
for the United States. It is being generally
adopted throughout the country, and many
leading manufacturers testify emphatically to
its merits. It effects an important saving of
steam, and one gentleman affirms that in his
mill it saves nearly one-half of the cost of fuel.
Another of the specialties of this firm is Little's
patent cart hoist, for which there is an extensive
demand. They employ in their works 50 hands,
and their machinery is driven by a steam engine
of 40 horse-power. In connection with their
machine shop they operate a large brass foundry.
The members of the firm are all practical
machinists, and have mingled intelligence with
enterprise in their business with the happiest
results. The work turned out at their establish-
ment will not suffer by comparison with the
most celebrated foreign workshops.

MISSOURI.

The Vulcan Iron Works, at South St. Louis,
are now turning out about 96 tons of finished
rails a day. A few days since they finished 20
complete rails in 31 minutes. All of the em-
ployees are paid by the ton, and the system is
found to work admirably. They are now using
equal parts of red short, blue specular and
brown hematite ores. A new furnace is being
erected on the south side of the works, next to
the river Des Peres.

A new company called the Salem Iron Com-
pany, of St. Louis, has been incorporated for
the purpose of mining iron ore, coal and other
minerals, of smelting said ores, and manu-
facturing all articles that may be made from iron
or steel. Capital stock, \$100,000, with privilege
to increase the same to \$300,000. William
Spear, Joseph P. Card, William J. Lewis, and
Benj. W. Lewis, of St. Louis, and A. B. Meeker,
of Chicago, are named directors for the first
year. The mines of the company are located in
Dent county, but the general office will be in
St. Louis.

The Missouri Zinc Company, whose works are
located at South St. Louis, a short distance
above the Vulcan Iron Works, are doing an ex-
tensive business. They are using ores from
the Granby mines and from Potosi. There are
two other zinc works at South St. Louis. One
of these is in operation. The other is being
enlarged and will soon resume.

ILLINOIS.

After a good many reports to that effect, with-
out any certainty of their truth, the Chicago,
Alton, and St. Louis Railroad Company has
finally decided to construct a bridge across the
Mississippi, at Louisiana. Its completion will
give the line, with its connections, an unbroken
route to Kansas City.

Following is the capacity per week of the
Joliet Iron and Steel Works, at Joliet, Ill.: Two
blast furnaces at Joliet, pig iron (on rich ores),
14,000 tons; two blast furnaces at Chicago, 350
tons; Bessemer plant, ingots, 700 tons; new
rail mill, rails, 1000 tons; old rail mill, 600 tons;
puddle mill, muck bar, 250 tons; coke works,
175 tons. The coal washers produce 150 tons
of washed slack per day. The fire brick works
are capable of making 3,000,000 bricks per
year. The shops are of sufficient capacity to
keep in repair all these works and a second
Bessemer works and merchant mill; also to
construct most of the machinery required for
further extensions. The officers are: Presi-
dent, A. B. Meeker; secretary and treasurer,
John H. Wrenn; superintendent, J. T. Tor-
rence.

WISCONSIN.

Milwaukee and Northern R. R. Company has
contracted with the Milwaukee Iron Company
for 2500 tons of rails, to be delivered in April
and May. This is sufficient to complete the
road from Menasha Junction to Green Bay.
Track-laying will begin as soon as the weather
permits.

The Reliance works of Messrs E. P. Allis &
Co., of Milwaukee, we understand, have taken
the contract for the St. Louis water works en-
gines against the competition of the world.

MICHIGAN.

Another new mining company has been or-
ganized, to operate in the Cascade region. The
company consists of Henry Wick, and others of
Cleveland, and F. W. Judd, of Flint, Mich., sec-
retary and manager. The company is known as
the Home Iron Mining and Manufacturing
Company. The lands are rich in a red specular
ore peculiar to the locality, and the company
goes into operation under the most favorable
circumstances.

The Green Bay Iron Company are preparing
to commence the season's work in their mine
on the Negaunee hematite range with vigor
and efficiency. They expect to have in stock
by the time the shipping season opens about
8000 tons of ore. They have graded a road bed
for 1800 feet of track, and will lay down the
rail as soon as weather permits, so as to load
cars in the mine and take them out over the
branch that taps the Allen mine.

Mr. George M. Pullman, now in Europe,
writes that he has concluded a contract with
the Midland Railway Company for the adoption
of his patent sleeping and drawing-room cars
on that road. The Midland is between London
and Liverpool, and is soon to embrace Glasgow
and Edinburgh. It is the longest road in Eng-
land and the most important. The contract is
the same as between the Pullman Company and
American roads. The first cars will be shipped
in September, consisting of ten of the different
varieties, which are already in progress of
manufacture at the Pullman works in Detroit.
They will be shipped in sections, and put to-
gether in England.

Keystone Saw, Tool, Steel & File W'ks,

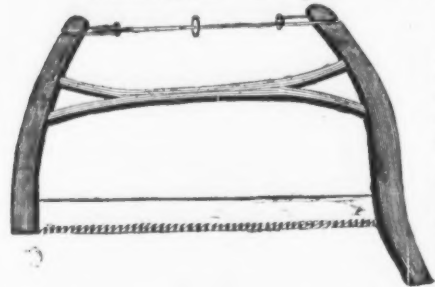
Front & Laurel Sts., PHILADELPHIA, PA.

HENRY DISSTON & SONS,

having rebuilt that portion of their extensive Works destroyed by the conflagration of Nov. 15, 1872, and having introduced new and improved Machinery for the Manufacture of every Article of the Trade, are prepared, with their increased facilities, to fill all orders with punctuality, promptness and dispatch.

Hankins' Elliptic Forked Saw Frame.

Patented June 28th, 1870.



The annexed engraving represents HANKINS' ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Frame being all in one piece, without any centre bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,
VULCAN SAW WORKS,
WILLIAMSBURG, N. Y.

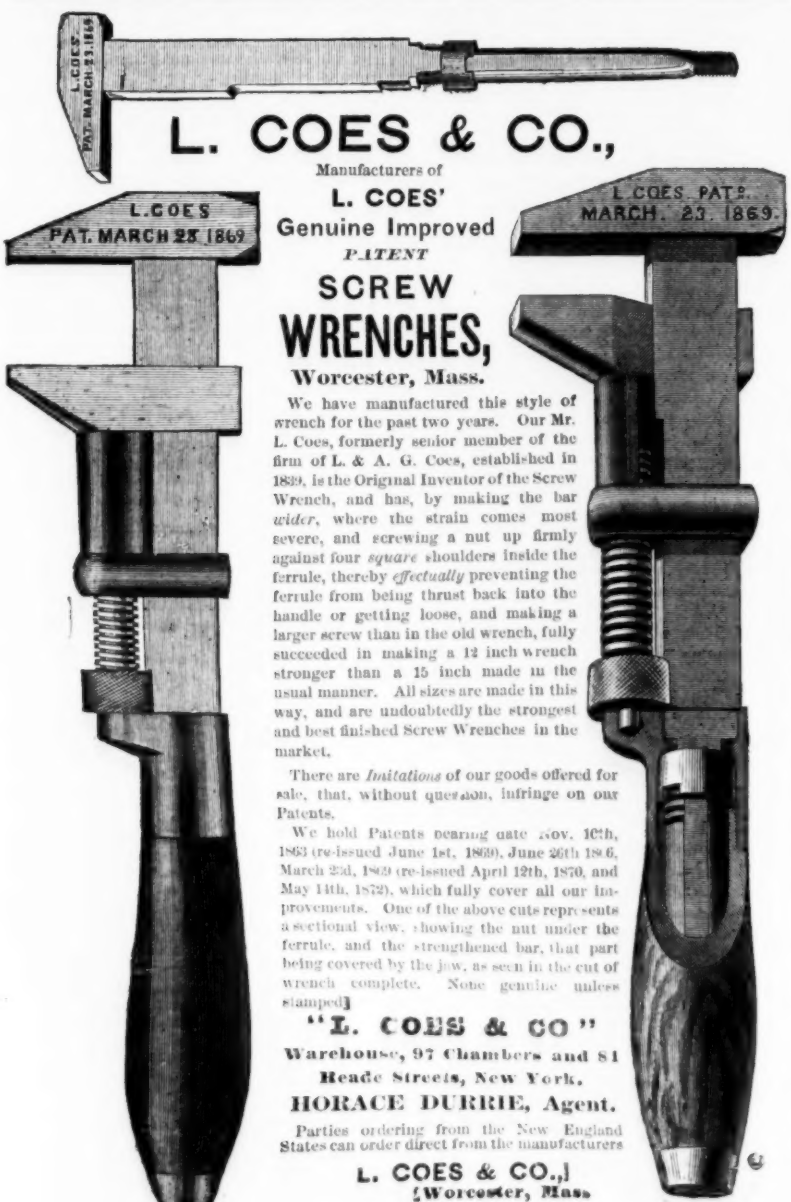
AMERICAN SAW CO.,

No. 1 FERRY STREET NEW YORK.



Solid saws require frequent gumming, thereby subjecting them to risk of springing or breaking. This is especially the case with cross cuts having Patent Teeth. In the perforated saws all gumming is avoided, and the teeth are easily kept long and in proper shape, saving files, labor, expense and taxation. As is well known, our saws cut faster, smoother and easier than any other.

MOVABLE-TOOTHED CIRCULAR SAWS AND SOLID SAWS OF ALL KINDS.



L. COES & CO.,

Manufacturers of

L. COES' Genuine Improved PATENT

SCREW WRENCHES,
Worcester, Mass.

We have manufactured this style of wrench for the past two years. Our Mr. L. Coes, formerly senior member of the firm of L. & A. G. Coes, established in 1839, is the Original Inventor of the Screw Wrench, and has, by making the bar wider, where the strain comes most severe, and screwing a nut up firmly against four square shoulders inside the ferrule, thereby effectually preventing the ferrule from being thrust back into the handle or getting loose, and making a larger screw than in the old wrench, fully succeeded in making a 12 inch wrench stronger than a 15 inch made in the usual manner. All sizes are made in this way, and are undoubtedly the strongest and best finished Screw Wrenches in the market.

There are Imitations of our goods offered for sale, that, without question, infringe on our Patents.

We hold Patents bearing date Nov. 10th, 1863 (re-issued June 1st, 1869), June 26th 1866, March 23d, 1869 (re-issued April 12th, 1870), and May 14th, 1872, which fully cover all our improvements. One of the above cuts represents a sectional view, showing the nut under the ferrule, and the strengthened bar, that part being covered by the jaw, as seen in the cut of wrench complete. None genuine unless stamped!

"L. COES & CO."
Warehouse, 97 Chambers and 81
Reade Streets, New York.
HORACE DURRIE, Agent.

Parties ordering from the New England States can order direct from the manufacturers

L. COES & CO.,
Worcester, Mass.



H. W. PEACE,

MANUFACTURER OF

SAWS OF ALL KINDS.

FACTORY, WILLIAMSBURG, N. Y.

LIVINGSTON'S PATENT BRACED WOOD SAWS,
Pat. BUTCHER & KITCHEN SAWS
Recognized Standard Goods for durability, quality and finish.
For sale by the Hardware Trade and
T. F. Cheritree & Co., New York.

Excelsior Saw Works.

515 Cherry St., Philadelphia.

WM. McNIECE,

Manufacturer of

Superior Cast Steel Hand, Panel, Ripping, Ice, Compass, Hack, Butchers' Bow, Grafting, Pruning, Keyhole and Web Saws, Mowing Knives, Trunk Springs, And all other kinds of Springs, made from Sheet Cast Steel.



We make a specialty of the LARGEST SIZES of Circular Saws, and call particular attention of lumber manufacturers to the following points of excellence: **Evenness of Temper.**—The peculiar structure of our turbine subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity. **Perfect Accuracy in Thickness.**—Our saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed **BALANCES PERFECTLY**, which is proof positive of the right accomplishment of the work. **Properly Hammered.**—Great care is taken that no saw shall leave our works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, can not be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time fit it TRUE. This department is under the personal supervision of our Senior, who has devoted over twenty years to the art of saw making. We are sole proprietors and manufacturers of the celebrated "Clipper" Cross-Cut Saw. Price Lists of all kinds of saws sent on application.

JAMES OHLEN.

NEW YORK SCREW BOLT WORKS.

(Estate of R. J. DEWHURST, deceased.)

JOHN COCHRANE, Executive Agent and Manager,

Office and Works, cor. Ave. D and 11th St., N. Y.

Bolts, Nuts, Turnbuckles, Washers, Forgings, &c

The attention of large consumers solicited.

Over 50,000 Sold.

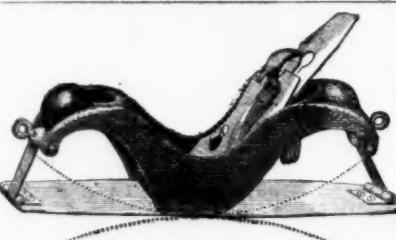
BAILEY'S PATENT Adjustable Planes.

Manufactured by the

Stanley Rule & Level Co.,
NEW BRITAIN, CONN.

Sold by all Hardware Dealers.

Warehouse, 55 Chambers St., New York.



WORRALL & CO.,

MANUFACTURERS OF

EXTRA CAST STEEL SAWS,

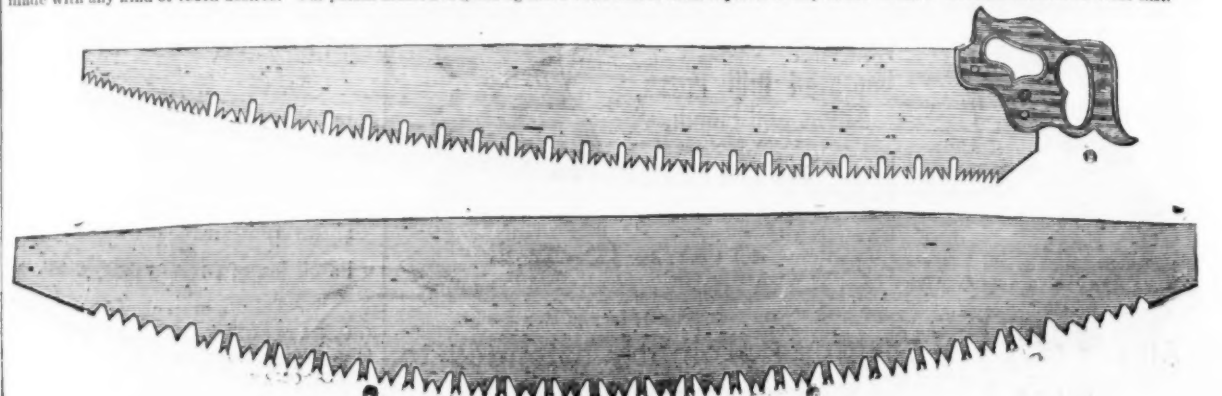
Plastering Trowels, Tools, &c.

Saw Manufactory, Iron Foundry & Machine Shops, ELIZABETHPORT, N. J.
Office and Warerooms, 28 Elm Street, New York.

J. FLINT & CO.,

Manufacturers of all kinds of SAWS and PLASTERING TROWELS, Rochester, N. Y.

A large Stock of Cross Cut Saws constantly on hand. Orders filled promptly. Dietrich's Double Handle One Man Cross Cut Saw made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for illustrated Price List.



BOYNTON'S LIGHTNING SAWS.

Awarded the Medal of the American Institute, 1872.



Two Direct Cutting Edges, instead of one Scraping Point. Note extra steel and durability over the old V, outlined on M tooth.

A Challenge of \$500, toward expense of a public test, to prove that the Lightning Saws excel all others in Speed, Ease, and Simplicity, has been offered since 1870, and has never been accepted. More than 100,000 Lightning Saws were sold during the year 1872, the purchasers of which testify to their superior merits.

Our leading papers, such as the Tribune, American Agriculturist, Christian Union, etc., have published over sixty editorial notices recommending these Saws. Farmer's Clubs, Lumbermen, and Hardware Dealers unite in pronouncing the genuine Lightning Saw the greatest labor-saving implement of the age.

I have hundreds of letters from practical sawyers, voluntarily written, expressing their entire approval of these Saws. Where the Hardware Trade do not sell the Lightning Saw, I will send a 6-foot cross-cut and a buck saw blade on receipt of \$5.

For Catalogue and additional information, address

E. M. BOYNTON, 80 Beekman St., New York,
Sole Proprietor and Manufacturer.

WHEELER, MADDEN

&

CLEMSON

Manufacturers of Warranted Cast Steel

SAWS

OF EVERY DESCRIPTION,

Including

Circular, Shingle, Cross Cut.

Mill, Hand, Roberts' and

other Wood Saws,

&c., &c.

CAST STEEL FILES

of the well-known brand of

WHEELER, MADDEN & CLEMSON.

FACTORIES:

Middletown, Orange Co., N. Y.

BRANCH OFFICE:

97 Chambers Street, New York.

Brundage Forged Horse Nails,

Manufactured from

BEST NORWAY IRON,

by BRUNDAGE & CO. Sold by

Wheeler Madden & Clemson,

MIDDLETOWN, ORANGE CO., N. Y.

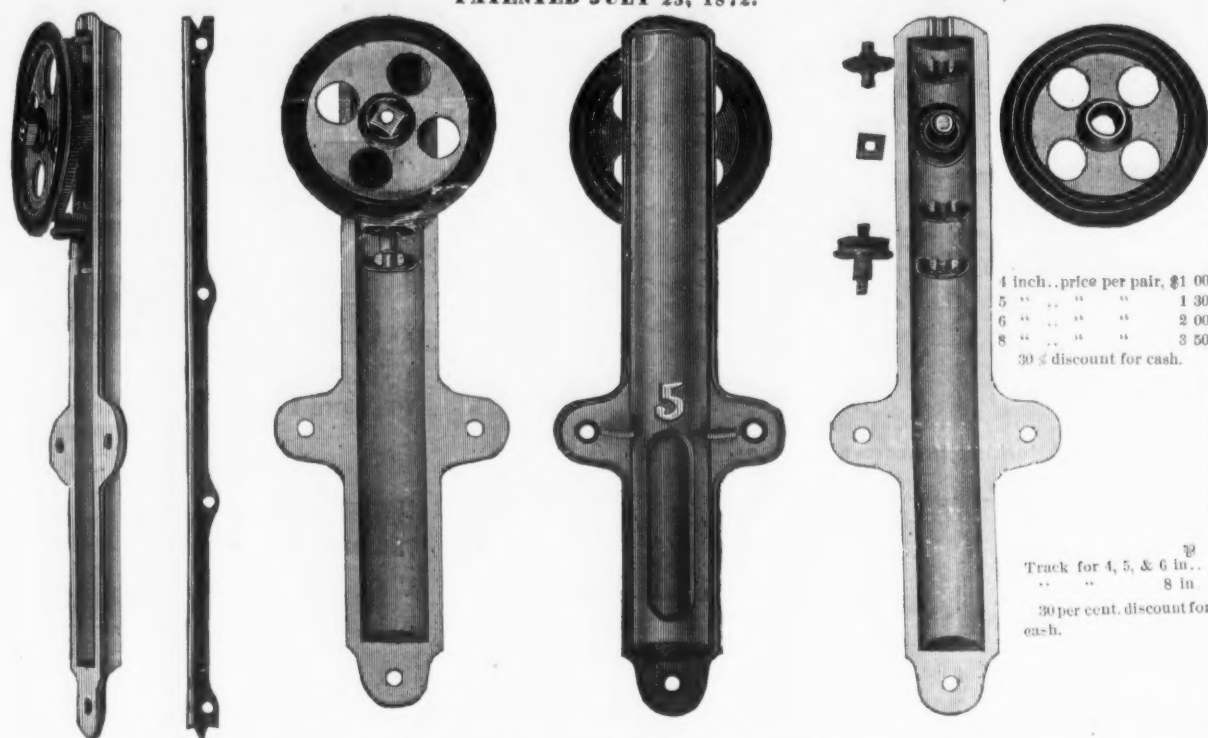
Vanderburgh, Wells & Co.
BOOK, NEWS, POSTER & JOB TYPE,
PRESSES AND INKS,

Printers and Engravers' Boxwood Depot, SHARP PATTERN and BRAND LETTERS for MACHINISTS, Imposing Stones, PATTERNS LETTERS for ARTIFICIAL PAVEMENTS, Eagle, California and other Improved Cabinets, Cases, Stands, Galleries and Composing Sticks.

110 Fulton and 16 & 18 Dutch Street, NEW YORK.

PATENT NOVELTY HANGER,

PATENTED JULY 23, 1872.



4 inch. price per pair, \$1 00
5 " " " " 1 30
6 " " " " 2 00
8 " " " " 3 50
30 % discount for cash.

Track for 4, 5, & 6 in.
8 in.
30 per cent. discount for cash.

We, without hesitation, offer this Hanger as the best article in the market for the purpose. Its many advantages over all other Hangers are as follows:
1st.—It is more than double as strong as any other Hanger, owing to its semi-cylindrical or curved back.
2nd.—It is provided with a friction wheel at the top of the Case, which bears against the rear or outside of the sheaves, and prevents it from leaning outward and causing it to run true, a feature not attained in any other Hanger.
3d.—By thus causing the sheave to run true, the doors are always held up close to the frame, and maintain a close joint around it.
4th.—The sheave has but one flange, there being a lower friction wheel provided with a flange which extends out under the face of the sheave and bears against the outer side of the track, which takes the place of the extra flange in the sheave, thus doing away with the grooved sheave which always grinds or breaks.
5th.—IT CAN NEVER RUN OFF THE TRACK.
6th.—It is the easiest running Hanger made, our 5 in. answering the same as 6 in. of the checkback and ordinary makes.
7th.—It is the Most Complete Hanger, in its construction, being tasty, as well as durable.

LOUDERBACK, GILBERT & CO., 53 Chambers Street, New York City.

Also Agents for the CONNECTICUT CUTLERY CO., of Naugatuck, Conn., and keep on hand a complete assortment of their goods.

Cutlery.

Landers, Frary & Clark,
New Britain, Conn.,
MANUFACTURERS OF

TABLE CUTLERY

OF EVERY DESCRIPTION. ALSO,

General Hardware,

IN VERY GREAT VARIETY.

298 BROADWAY, N. Y.

HENRY DICKINSON,
Sheffield Cutlery, Files, &c.,

66 & 68 READE STREET (near Broadway), NEW YORK.

Manufacture, SHEFFIELD, ENGLAND.

Isaac Milner's Fine Pocket and Table Cutlery.
Howard Bro.'s Medium Pocket Cutlery.
J. B. Osberton & Co.'s Medium Table Cutlery.
Isaac Milner's Razors, Butcher and Hunting Knives.
Hargreaves, Smith & Co.'s "Imperial" Files.
Milner's "X" and Collins' "IXL" Hand Saws.

JOSEPH S. FISHER,

No. 411 Commerce St., PHILADELPHIA,

AGENT FOR

George Wostenholm & Son,
Washington Works, SHEFFIELD,
Celebrated I-XL Cutlery, Razors, &c.

SOLE AGENT FOR THE UNITED STATES OF
WALTER SPENCER & CO.,
Steel and File Manufacturers,
Rotherham, ENGLAND.

Corporate Mark.

WALTER SPENCER
ROTHERHAM

Granted 1777

Notice of Removal.
ASLINE WARD,

From 54 Beekman St. to No. 101 and 103
Duane St., N. Y.

REPRESENTING
GEO. WOSTENHOLM & SON
CUTLERY AND RAZORS,
WASHINGTON WORKS, SHEFFIELD.

CORPORATE MARK.



FRED'K WARD & CO., SHEFFIELD,
CUTLERY & TABLE KNIVES.

CORPORATE MARK.



The Miller Bros. Cutlery Company,
Manufacturers of Patent

FINE PEN AND POCKET CUTLERY,
WEST MERIDEN, CONN.

We warrant our Knives equal in cutting qualities
and workmanship to any made. We also make
SILVER PLATED POCKET KNIVES,
which will not rust or become discolored when used as
any other Knife, and their cutting qualities are equal to
any other Knife.

CLARK, WILSON & CO., Agents,
81 Beekman Street NEW YORK.

RICHARD A. TURNOR,
37 Chambers St., New York,

Agent for

F. W. HARROLD,
Hardware Commission Merchant,
BIRMINGHAM.

JOSEPH ELLIOT & SONS,
Manufacturers of Razors, Table Knives, &c.,
SHEFFIELD.

CORPORATE MARK,



Joseph Rodgers & Sons'
(LIMITED)

CELEBRATED CUTLERY,
No. 82 Chambers Street, New York.
CHARLES PEACE, Jr., Agent.

The demand for Joseph Rodgers & Sons'
productions having considerably increased they
have, in order to meet it, greatly extended their
Manufacturing Premises and Steam Power.
To distinguish Articles of Joseph Rodgers
& Sons' Manufacture, please to see that they bear
their Corporate Mark.

ESTABLISHED 1852.

NEW YORK KNIFE CO.

MANUFACTURERS OF SUPERIOR

Table & Pocket Cutlery,

WARRANTED TO BE MADE OF THE BEST
MATERIAL.

WALKILL RIVER WORKS,

Walden, Orange Co., New York.

THOS. J. BRADLEY, President.

WALSH, COULTER & FLAGLER,

83 Chambers and 65 Reade Sts., New York,

AMERICAN AND FOREIGN

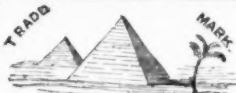
HARDWARE,

SOLE AGENTS FOR THE SALE OF

JOHN ROTHERY'S
CELEBRATED FILES.

Walden Co-operative Knife Co.

SUPERIOR POCKET CUTLERY.



Nixon & Winterbottom,

PYRAMID WORKS, Sheffield, Eng.
Manufacturers of Table Cutlery, Butcher Knives,
Broad Knives, &c., by patent and Improved Ma-
chinery. Agents: U. S. Smith & Hall, 58 & 60 Reade
St., N. Y.; Canada, Thos. Ellis & Co., Sheffield, Eng.

Thomas Taylor,

43 Chambers Street, New York.

Agent for

HENRY H. TAYLOR,

SHEFFIELD CUTLERY,

Graining Combs.
Sole Agency in the U. S.
for
JONATHAN CROOKS & SONS'
Celebrated Pen, Pocket and
Sporting Knives.

Corporate Mark.

Higginum Manufg Co.,
Higginum, Ct., Manufacturers of all kinds of
Plows, Hay Spreaders and
Agricultural Implements in general.
Storehouse, Warehouse,
and all kinds of Trucks a specialty.
Orders solicited.

MALLORY, WHEELER & CO.,

NEW HAVEN, CONN.

MANUFACTURERS OF

Door Locks, Knobs, Padlocks,

BRONZE DOOR FURNITURE, &c.

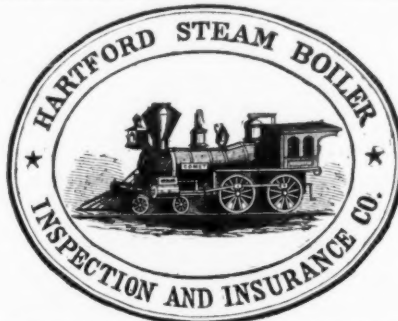
Attention is called to our

Improved Builders' Lock

as being the best REVERSIBLE LOCK made; equal in all respects
to the old Style HANDED LOCK.

Agencies:

Sargent & Co., - - New York.
Heaton & Denckla, - Philadelphia.
Scudder, Rogers & Co., Boston.
Keith & Kelso, - - Baltimore.



CAPITAL - - \$500,000.

Issues Policies of Insurance, after a careful Inspection of the Boilers

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

ARISING FROM

STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of STEAM BOILERS.

Full information concerning the plan of the Company's operations can be obtained at the
COMPANY'S OFFICE, HARTFORD, CONN.,
or at any Agency.

J. M. ALLEN, Pres. CHAS. M. BEACH, Vice-Pres. J. B. PIERCE, Sec'y.

Board of Directors:

J. M. ALLEN, President.
LUCIUS J. HENDEE, Pres't Atlas Fire Ins. Co.
FRANK W. CHENEY, Ass't Treas. Cheney Brothers
SUK Manufacturing Co.
CHARLES M. BEACH, of Beach & Co.
PHILIP PHILLIPS, of Adams Express Co.
GEO. M. BARTHOLOMEW, Pres't Amer. Nat'l Bank.
RICHARD W. H. JARVIS, Pres't Colt's Fire Arms
Manufacturing Co.
EDWARD M. REED, Sup't Hartford & N. Haven R.R.
Hon. CHAS. M. FOND, Treas. State of Connecticut.
THOMAS O. HENDERS, Sec'y Aetna Life Ins. Co.
LEVERETT BRAINARD, of Case, Lockwood & Brain-
ard.
GEN. WM. B. FRANKLIN, Vice Pres't Colt's Pat. Fire
Arms Mfg. Co.
AUSTIN DUNHAM, Pres't William Loom Works, Worcester.
GEO. CROMPTON, Crompton Loom Works, Worcester.
KARL P. MARSON, Pres't Prov. & Wor. R.R. Prov.
WILLIAM ADAMSON, of Baeder, Adamson & Co.
Phila.
WM. B. BEMENT, of Wm. B. Bement & Co., Phila., Pa.

THEO. H. BABCOCK, Manager,

New York Branch, No. 1 Park Place.

ROWE & POST,

MANUFACTURERS OF

Shears, Trimmers, Scissors, &c.

No. 120 Chambers and 50 Warren Streets,

TRADE MARK.
J. Rowe's XL.

NEW YORK.

Send for Catalogue.

TRADE MARK.
Aetna Shear Co.

Iron & Brass Wood Screws.

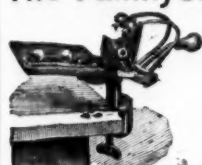
Full assortment constantly on hand.

ALFRED FIELD & CO.,

Importers,

47 John, and 5 Dutch Streets, N. Y.

The Family Cherry Stoner.



The only really practi-
cal cherry stoner ever
made. It does its work
perfectly, without mash-
ing the fruit.

D. H. GOODELL, Sole Manufacturer

Office & Salesroom, 55 Chambers St., N. Y.

Works at Antrim, N. H.

Also sole manufacturer of Turn Table and Light-
ning Apple Parers, Lightning Peach Parers
and Citrus Apple Corers.

G. D. ROSEBERRY,

MANUFACTURER OF

**Railroad & Mining Spikes
and Bolts.**

All sizes on hand.

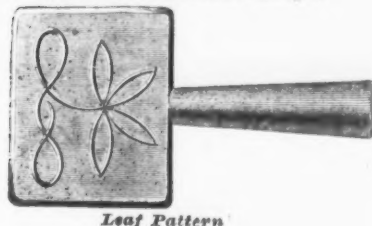
POTTSVILLE, PA.



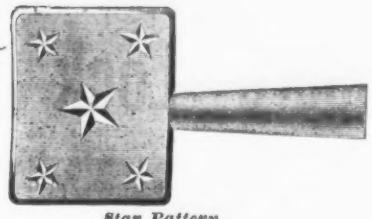
MAYER'S BOILER COMPOUND for the Removal and Pre-
vention of Scale and Sediment from Steam Boilers.
It is entirely free from acids; for efficiency it is
the cheapest invented. Price, 25 cents a pound.
Parties trying this compound and finding it other
than represented are freed from any cost. All I ask
is a fair trial, and insure satisfaction. I will send to
any party as many pounds as they need for trial, and
ask payment only after they are satisfied. 1-3 of a
pound for each horse power for first trial; after, 1-8
of a pound every two weeks. Send for Circulars.
I. MAYER, Manufacturer, 99 Mercer St., N.

H. D. SMITH & CO., PLANTSVILLE, CONN.

Patent Embossed Steps.



Leaf Pattern.



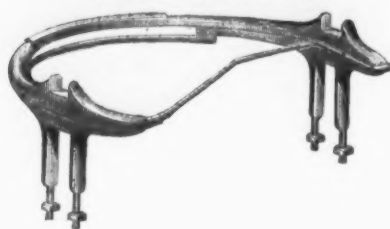
Star Pattern.

King Bolt Yokes.



Established 1850.

No. 6 Fifth Wheels.



1871 Pattern Shaft Couplings.



Patent Cross Bar Steps.

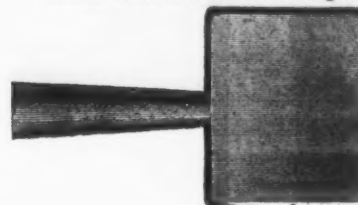


Upper View.



Lower View.

Solid Plain Pattern Steps.



Smith's Improved Philadelphia Pattern Slat Irons.



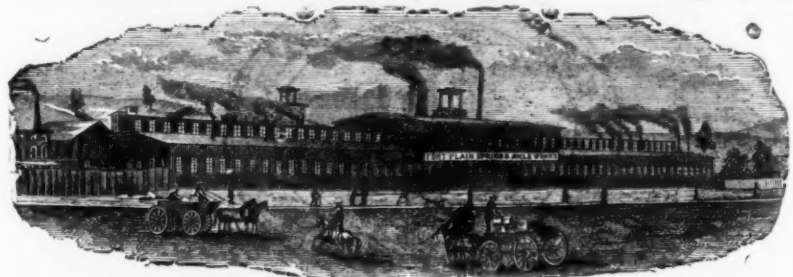
MANUFACTURERS OF A LARGE VARIETY OF FIRST-CLASS

FORGED CARRIAGE IRONS.

Send for Price List.

FORT PLAIN SPRING & AXLE WORKS, CLARK, SMITH & CO.,

Green Jacket Axles. FORT PLAIN, N. Y. Fine Carriage Springs.



MANUFACTURERS OF

English and Swedes Steel Springs, and Iron and Steel Axles.

Execute orders promptly for

Black, Bright, Tempered and Oil Tempered Springs,
Of any Pattern or Style. Also for AXLES of any description, from a COMMON LOOSE
COLLAR to the FINEST OF STEEL.

Our facilities for manufacturing are very extensive, and with our recent additions of new and improved
machinery, we defy competition.

Send for Price List and Descriptive Circular.

CARRIAGE BOLTS.

Buy the Best.

Clark's Patent
Carriage Bolt.

Best Bolt manufactured for all kinds of agricultural machinery. Will not split the wood, and can not
turn in its place.

MANUFACTURED BY

CLARK BROS. & CO., Milldale, Conn.

Also Manufacturers of

Plow and Machine Bolts, Coach Screws, Nuts, Washers, Tire Blanks, Rivets, &c.
Send for New Illustrated Price List, just completed.

R. M. GREEN & CO.,

110 Chambers Street, NEW YORK.

Hardware Manufacturers' Agents.

REPRESENT:

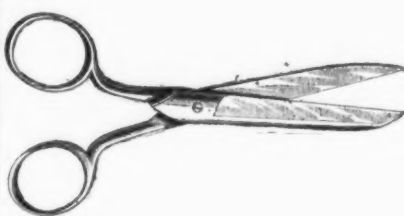
HATCHER MFG. CO., Cast Steel Forks, Rakes, &c.
VERMONT SNAPE CO., Snaths.
H. C. COLE, Ox Bows.
NORTH CAROLINA HANDLE CO., Axe and Pick Handles.
EXCELSIOR MFG. CO., Carriage Rims, Hubs and Spokes, Wood Hay Rakes,
VERMONT MFG. CO., Hay, Manure and Shovel Handles. All kinds of Ash, and
Hickory Timber Sawed and Turned to order.

CARRIAGE MATERIALS.

AXLES
Blacksmiths' Supplies,
Bolts, Woodwork,
TRIMMINGS, &c.
Iron & Steel.
HORSE SHOES
Manufactured and sold by
GUY C. HOTCHKISS & FIELD
85 First Street, Brooklyn, E. D.

H. M. WENTWORTH & CO.,

Manufacturers of
Carriage Axles & Springs,
BEST SWEDEN STEEL,
Sword Tempered, and
Common Patent Tempered SPRINGS
Of every description, made to order.
Dam No 1, Water St., Gardiner Me.
Send for Price List.
H. M. Wentworth, F. A. Plalsted,
David Wentworth.

For sale by Machine Agents and Dealers
Simonds Mfg. Co., Fitchburg Mass.

United States Steel Shear Company,
West Meriden, Conn.
Solid Steel Scissors.

Phila. Carriage Bolt Works,

Established 1855.



Hand-made Axle Clip.

T. SKELLY

MANUFACTURER OF FINEST QUALITY OF

NORWAY IRON

CARRIAGE & TIRE BOLTS,

Hand Made Axle Clips,

Skelly's Improved T-Head & Whiffletree Bolts,

Cone, Cheese, Square and Diamond Head

BOLTS,

And all the Different Varieties Used by Makers of

Fine Carriages,

TWENTY-FOURTH ST., BELOW CALLOWHILL,
PHILADELPHIA, PA.

EVERY BOLT AND NUT WARRANTED TRUE TO SIZE AND FIT.

Skelly's New Style Improved
T Head or Shaft Bolt.

Cone Head Bolt.

Elliptic Head
Perch Bolt.

Leather Belting.

BACON BROTHERS, TANNERS,

And Manufacturers of Oak

Leather Belting

PATENT

Lace and Factory Leather.

M. P. BACON. Pawtucket, R. I.
H. E. BACON.

Alexander Brothers, Manufacturers of OAK TANNED

Leather Belting

412 North 3d, Philadelphia, Pa.

WM. COUPE & CO.,

Inventors and sole man'rs of the celebrated

Excelsior Lace & Picker Leather.

Also, Manufacturers of the Wood and Page

LACE LEATHER,
South Attleboro, Mass.

WM. H. STOYLE.

MANUFACTURER OF

Machine Cut Belt Lacing.

No. 403 Library Street,

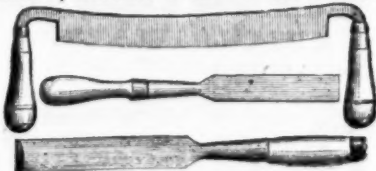
PHILADELPHIA.



Solid Cast Steel Drag Teeth.

A set of 40 boxed and delivered to Express or R. R. :
1/2 in. long, about 45 lbs., for \$6.00
3/4 in. long, about 61 lbs., for \$7.50
Liberal discount to the Trade. Address
SWEET'S MFG. CO., Syracuse, N. Y.

HART, BLIVEN & MEAD MFG. CO.,



CHARLES BLIVEN, Pres. EDWARD B. MEAD Treas.

Office and Warehouse at:

243 and 245 Pearl, and 18 and
20 Cliff Streets,
NEW YORK.

Three Sets of Factories at Kensington
Conn.,
MANUFACTURERS, IMPORTERS AND DEALERS IN

General Hardware.

THE Philadelphia Star Bolt Works.

Carriage and Tire Bolts,

Axle Clips,

Blank Bolts, &c.

Square Head Bolts,

Wood Screws.

Plow Bolts, &c.

TOWNSEND, WILSON & HUBBARD,

2301 Cherry Street, PHILADELPHIA,

MANUFACTURERS OF THE CELEBRATED

"STAR" Brand of Axle Clips.

The Iron Age Directory

and Index to Advertisements.

	Page.
Agricultural Implements, Manufacturers of.	
Hilgann Mfg. Co., Hingham, Ct.	11
Agricultural Steels, etc., Makers of.	
Nellis A. J. & Co., Pittsburgh, Pa.	28
Anvils, Manufacturers of.	
Fisher & Norris, Trenton, N. J.	20
Augers, Bits, &c., Manufacturers of.	
Shattuck W. F. & Co., 113 Chambers, N. Y.	8
Axes, Springs, &c., Manufacturers of.	
Clark & Smith, Fort Plain, N. Y.	12
Hotchkiss Guy C. & Field, Brooklyn, E. D.	12
Wentworth H. M. & Co., Gardiner, Me.	12
Band Saw Machines, Makers of.	
Richards, Loudon & Kelley, Phila.	31
Bellows, Manufacturers of.	
Churchyard Joseph, Buffalo, N. Y.	7
Newcomb Bros. Sons, 586 Water, N. Y.	24
Belt Pouches, Manufacturers of.	
Kellogg E. C. & Co., Hartford, Conn.	30
Bird Cages, Makers of.	
Lindemann A. & Co., 254 Pearl, N. Y.	3
Maxheimer John, 243 Pearl, N. Y.	20
Bit Braces, Manufacturers of.	
Miller's Falls Mfg. Co., 78 Beekman, N. Y.	21
Boilers Steam.	
Burnet & Leonard, Newark, N. J.	31
Verner, Thos. 30th and Chestnut, Phila.	31
Boiler Compound, Makers of.	
Mayer L. 99 Mercer, N. Y.	11
Boiler Heating Machines, Mfrs. of.	
Chapin Machine Co., New Hartford, Ct.	30
Lewis, Oliver & Phillips, Pittsburgh, Pa.	7
Plumb, Burdick & Barnard, Buffalo, N. Y.	32
Brass, Manufacturers of.	
Ansonia Brass & Copper Co., 19 Cliff, N. Y.	2
Benedict & Burnham Mfg. Co., Waterbury, Ct.	2
Brooklyn Brass & Copper Co., 100 John, N. Y.	2
Coe Brass Mfg. Co., Wolcottville, Conn.	2
Plume & Atwood Mfg. Co., 80 Chambers, N. Y.	2
Seavill Mfg. Co., 4 Beekman, N. Y.	2
Wallace & Sons, 89 Chambers, N. Y.	2
Waterbury Brass Co., 52 Beekman, N. Y.	2
Brick Presses, Makers of.	
Carnell Geo., 1819 Germantown Ave., Phila.	24
Carnell F. L. & D. R., 1844 Ger. Ave., Phila.	24
Miller S. P., 309 S. 5th, Phila.	24
Bridge Builders.	
Moseley Iron Bridge and Roof Co., 5 Dey, N. Y.	4
Bronze Wares, Manufacturers of.	
Corbin P. F., 87 Chambers, N. Y.	17
Whitney Mfg. Co., 162 & 164 W. 27th St., N. Y.	17
Brushes, Manufacturers of.	
Wood E. & C., 299 Pearl, N. Y.	13
Butts and Hinges, Makers of.	
Elina Nut Co., Southington, Conn.	22
Crooke & Co., 163 Mulberry, N. Y.	11
Roy & Co., West Troy, N. Y.	22
Stanley Works, 58 Beekman, N. Y.	22
Union Mfg. Co., 53 Chambers, N. Y.	5
Cabinet Hardware, Manufacturers of.	
Landers, Frary & Clark, 53 Chambers, N. Y.	11
Carriage Bolts, Makers of.	
Skelly T., 24th below Callowhill, Phila.	12
Townsend, Wilson & Hubbard, Phila.	12
Carriage Hardware, Makers of.	
Smith H. D. & Co., Plantville, Ct.	12
Car Wheels, etc., Manufacturers of.	
Jackson & Woodin Mfg. Co., Newark, Pa.	4
Taylor Iron Works, High Bridge, N. J.	6
Cash Drawer—Alarm, Manufacturers of.	
Tucker & Dorsey, Indianapolis, Ind.	14
Casters—Furniture, Manufacturers of.	
Toler John, Sons & Co., Newark, N. J.	32
Chains, Makers of.	
Kendrick & Runkle, Trenton, N. J.	31
Cherry Stoppers, Makers of.	
D. H. Goodell, Antrim, N. H.	11
Chisels, Manufacturers of.	
Buck Bros., Millbury, Mass.	22
Hart, Bliven & Mead Mfg. Co., 243 Pearl, N. Y.	12
Clothes Wringers, Manufacturers of.	
Providence Tool Co., 11 Warren, N. Y.	12
Coals, Dealers in.	
Boyer L. S. & Co., 70 Broadway, N. Y.	26
Coal, Miners of.	
Pardee A. & Co., 111 Broadway, N. Y.	13
Coal and Iron, Dealers in.	
Persons B. W., 39 Wybosset, Providence, R. I.	26
Coal Hods, Manufacturers of.	
Smith, Burns & Co., 43 Cliff, N. Y.	26
Coffee and Spice Mills.	
Lane Brothers, Millbrook, N. Y.	3
Coffin Trimmings, Makers of.	
Wayne Hardware Co., Cincinnati, O.	20
Commission Merchants, English.	
Goodard Samuel A. & Co., Birmingham, Eng.	15
Compasses and Dividers, Manufacturers of.	
Bemis & Call Hdw. & Tool Co., Springfield, Mass.	24
Composition Rolls, Makers of.	
Fuller Frederick, Providence, R. I.	31
Cooper's Tools, etc., Dealers in.	
Little Chas. E., 59 Fulton, N. Y.	20
Cordage, Rope, &c.	
Allen D. Sons, 139 Front, N. Y.	32
Corrugated Steel Pipe Elbows, Makers of.	
Corrugated Metal Co., East Berlin, Conn.	4
Sellow Elbow Co., N. Y., and Chicago.	24
Cups, Manufacturers of.	
Newkumt Adam, 1337 N. Front, Phila.	24
Joseph Dixon Crucible Co., Jersey City, N. J.	32
Ross, Strow & Hofferkamp, 1488 N. 6th, Phila.	32
Taylor, Strow & Co., Phila.	32
Curry Combs, Manufacturers of.	
Kellogg W. P. & Co., Troy, N. Y.	20
Cutlery, Importers of.	
Bohnstedt-Kind (Solingen), 271 Canal, N. Y.	11
Dickinson Henry, 66 and 68 Reade, N. Y.	11
Fisher Jos. S., 411 Commerce, Phila.	11
King H. & J. W., 80 Chambers, N. Y.	11
Pence Chas. Jr., 82 Chambers, N. Y.	11
Ward Aseline, 101 Duane, N. Y.	11
Wilson Hawksworth, Ellison & Co., 80 John, N. Y.	28
Smith & Hall, 58 & 60 Reade, N. Y.	11
Taylor Thomas, 43 Chambers, N. Y.	11
Cutlery, Manufacturers of.	
American Knife Co., Thomaston, Conn.	11
Burkshaw Aaron, Pepperell, Mass.	11
Landers, Frary & Clark, 298 Broadway, N. Y.	11
Miller Bros. Cutlery Co., W. Meriden, Conn.	11
New York Knife Co., W. Meriden, Conn.	11
U. S. Steel Shear Co., W. Meriden, Conn.	11
Differential Pulley Blocks, Makers of.	
Van Wart & McCoy, 43 Chambers, N. Y.	31
Drag Teeth, Solid Cast Steel.	
Sweets Mfg. Co., Syracuse, N. Y.	12
Dredging, and Makers of Dredging Machines.	
Am. Dredging Co., 214 S. Delaware ave., Phila.	30
Drill Chucks, Manufacturers of.	
Cushman A. F., Hartford, Ct.	30
Hubbard & Curtis Mfg. Co., N. Y.	21
Drills (Hand), Blacksmiths, Makers of.	
Morell & Tibout, Williamsburg, N. Y.	22
Drilling Machines, Makers of.	
Thorne & DeHaven, Philadelphia.	30
Edge Tools, Makers of.	
G. W. Bradley, 37 Chambers, N. Y.	8
Elevators, Makers of.	
Otis Bros. & Co., 348 Broadway.	9
Emery Wheels, Makers of.	
The Tanite Co., Stroudsburg, Pa.	29
The Union Stone Co., 16 Exchange, Boston.	29
Merrill E. C., 91 Liberty, N. Y.	29

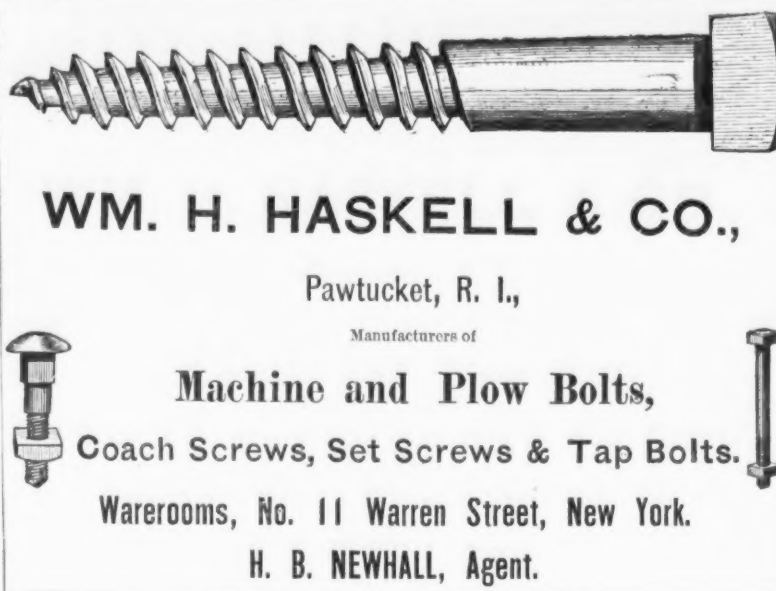
Enamelled and Plain Hollow Ware, Mfrs. of.	
Foxell & Jones, Troy, N. Y.	31
Engines, Machinists, etc.	
Henshall James, 1056 Beach, Phila.	31
Taws & Hartman, 1295 N. Front, Phila.	31
Engines, Steam, Makers of.	
Fishkill Landing Mch. Co., Fishkill-on-the-Hudson, N. Y.	30
N. Y. Steam Engine Co., 121 Chambers, N. Y.	30
Utica Steam Engine Co., Utica, N. Y.	30
Whitehill, Smith & Co., Newburgh, N. Y.	30
Wright J. W., 112 Spruce, Phila.	30
Engravers, Wood.	
Patterson Jas. S., 21 Spruce, N. Y.	30
Roberts Wm., 36 Beekman, N. Y.	30
Tuttle D. H., 5 Beekman, N. Y.	30
White H. R., 52 John, N. Y.	30
Faucets, Self Measuring, Makers of.	
Enterprise Mfg. Co., of Pa., Phila. and N. Y.	26
Files, Importers of.	
Carr J. & Riley, 82 John, N. Y.	28
Dickinson Henry, 66 and 68 Reade, N. Y.	11
Fisher Joseph S., 411 Commerce, Phila.	11
Moss F. W., 80 John, N. Y.	28
Sanderson Bros. & Co., 16 Cliff, N. Y.	28
Spear & Jackson, 98 Chambers, N. Y.	28
Fires, Manufacturers of.	
Barnett G. & H., 41 and 43 Richmond, Phila.	8
McCaffrey & Bro., 1732 and 1734 N. 4th, Phila.	8
Nicholson File Co., Providence, R. I.	8
Rothery John & William, 83 Chambers, N. Y.	11
Wheeler, Clemson & Co., Middletown, N. Y.	10
Fire Arms, Manufacturers of.	
Remington E. & Sons, Ilion, N. Y.	7
Robinson M. W., 73 Chambers, N. Y.	7
Schoverling & Daly, 34 Chambers, N. Y.	7
Fire Brick, Makers of.	
Bowman O. & Co., Trenton, N. J.	21
Hall A. & Sons, Perth Amboy, N. J.	24
Kreischer H., 58 Goerck, N. Y.	24
Newkumt Philip, 231 and 233, Phila.	24
Palmer, Newton & Co., Albany, N. Y.	24
Watson John R., Perth Amboy, N. J.	24
Fire Department Supplies, Mfr. of.	
Allen Albert F., Providence, R. I.	26
Fluting Machines, Makers of.	
Lowrey & Tucker, Newark, N. J.	15
Gage Cocks & Damper Regulators.	
Murrill & Kelzer, Baltimore, Md.	31
Gastrolated Iron.	
Lefferts Marshall Jr., 4 Beekman, N. Y.	4
Gate Hinges, self closing, Makers of.	
Clark & Co., Buffalo, N. Y.	22
Glass, Importers of.	
Downing A. C. & Co., 57 Beekman, N. Y.	13
Glue Pots, Family, Makers of.	
J. & E. Stevens Co., Commerce, Conn.	26
Governors, Makers of.	
Lynde J. D., Philadelphia, Pa.	31
Grindstones.	
McDermott J. & Co., Cleveland, O.	29
Wood Walter H. & Co., 385 and 389 Front, N. Y.	29
Gunpowder, Makers of.	
Kneeland F. L. (Dupont) 70 Wall, N. Y.	28
Ladlin & Rand Powder Co., 21 Park Row, N. Y.	28
Hammers, etc., Manufacturers of.	
Industry Mfg. Co., 76 Reade, N. Y.	20
Nelson Tool Works, 157 E. 32d, N. Y.	20
Milnot & Co., Oliver, Boston.	20
Hardware Auctioneers.	
R. T. Hazell & Co., 113 Chambers, N. Y.	21
Hardware, Brass and Galvanized.	
Tiebout W. & J., 200 Pearl, N. Y.	2
Hardware, Commission Merchants.	
Fernald & Sise, 31 Beekman, N. Y.	8
Gerzabek O. V., San Francisco, Cal.	11
Green R. M. & Co., 100 Chambers, N. Y.	12
Graham & Holmes, Chambers, N. Y.	12
Jewett & Roberts, 109 Chambers, N. Y.	12
Walbridge Geo. B., 53 Chambers, N. Y.	22
Hardware Dealers.	
Brown, Harris & Hopkins, 190 Greenwich, N. Y.	15
Brower J. I. & Co., 288 Greenwich, N. Y.	15
Finney Thos. L. & Co., Vicksburg, Miss.	14
Hubbard & Curtis Mfg. Co., 243 Pearl, N. Y.	12
Lloyd, Supple & Walton, 625 Market, Phila.	8
Louderback, Gilbert & Co., 53 Chambers, N. Y.	11
Shepard Sidney & Co., Buffalo, N. Y.	21
Turner, Seymour & Judds, Duane, N. Y.	11
Walsh, Coulter & Flagler, 83 Chambers, N. Y.	11
Hardware Importers.	
Beam & Murray, 54 Cliff, N. Y.	32
Baker Hermann & Co., 101 Duane, N. Y.	32
Bruce Geo. W., 1 Platt, N. Y.	17
Field Alfred & Co., 47 John, N. Y.	21
Hilger & Sons, 87 Chambers, N. Y.	11
King H. & J. W., 80 Chambers, N. Y.	11
E. Frith, 16 Cliff, N. Y.	11
Louderback, Gilbert & Co., 53 Chambers, N. Y.	11
Van Wart & McCoy, 43 Chambers, N. Y.	31
Turner R. A., 37 Chambers, N. Y.	11
Wiebusch F., 84 Chambers, N. Y.	22
Hardware Specialties.	
Biddle Mfg. Co., 78 Chambers, N. Y.	22
Corbin P. F., 87 Chambers, N. Y.	22
Enterprise Mfg. Co., Phila.	12
Hart, Bliven & Mead Mfg. Co., 243 Pearl, N. Y.	12
Hubbard & Curtis Mfg. Co., 82 Chambers, N. Y.	21
Kellogg Wm. P. & Co., Troy, N. Y.	20
Lane, Gale & Co., Troy, N. Y.	8
Louderback, Gilbert & Co., 53 Chambers, N. Y.	11
Many F. L. & Marshall, 48 Warren, N. Y.	11
Middletown Tool Co., 82 Chambers, N. Y.	12
Miller's Falls Mfg. Co., 78 Beekman, N. Y.	21
Pratt & Co., Buffalo, N. Y.	21
Providence Tool Co., 11 Warren, N. Y.	12
Russell & Erwin Mfg. Co., 45 Chambers, N. Y.	21
C. Schweitzer, 57 Reade, N. Y.	21
Shattuck W. F. & Co., 113 Chambers, N. Y.	8
Stanley Works, 58 Beekman, N. Y.	22
Taylor Mfg. Co., New Britain, Conn.	21
Union Mfg. Co., 53 Chambers, N. Y.	5
Williams, White & Churchill, 73 Warren, N. Y.	8
Wilson Mfg. Co., 37 Chambers, N. Y.	21
Helve Hammers, Makers of.	
Bradley Mfg. Co., Syracuse, N. Y.	20
Hoisting Engines, Makers of.	
Morris Co. Mch. and Iron Co., 36 Cortlandt, N. Y.	30
Otis Bros. & Co., 348 Broadway, N. Y.	9
Horse Nails, Makers of.	
Andale Horse Nail Co., 35 Chambers, N. Y.	32
Brundage & Co., Middletown, N. Y.	32
Globe Nail Co., Boston, Mass.	32
Pratt & Co., Buffalo, N. Y.	22
Putnam, S. S. & Co., Neponset, Mass.	8
Horse Shoes, Makers of.	
Balden Iron, Troy, N. Y.	4
Hubs and Spokes, Mfrs. of.	
Gleason J., 2nd & Diamond, Phila.	12
Ice Cream Freezers, Makers of.	
Blatchley C. G., 506 Commerce, Phila.	7
Packer C. W., Philadelphia.	15
Torry E. S. & J., 166 Fulton, N. Y.	21
Insurance, Boiler.	
Hartford Steam Boiler and Inspection Co.	11
Iron Brokers.	
Boynton Geo. A., 70 Wall, N. Y.	4
Hazard & Jones, 412 Pearl, N. Y.	4
Pettit Wm. H., 73 Wall, N. Y.	4
Iron, Corrugated, Manufacturers of.	
Corrugated Metal Co., East Berlin, Ct.	15
Quincy John W., 58 William, N. Y.	4
Iron Commission Merchants.	
Blackiston & Cox, 333 Walnut, Phila.	6
Hand Jas. C. & Co., 614 & 616 Market, Phila.	9
Malin Bros., 228 Arch, Phila.	6
Iron, Pig, Importers of.	
Williamson James & Co., 69 Wall, N. Y.	4
Iron Dealers.	
Abel Brothers, 190 South, N. Y.	4
Higdon & Johnson, 48 Phila., N. Y.	4
Bonpell, Botsford & Co., Youngstown, O.	6
Borden & Lovell, 70 & 71 West, N. Y.	4
Buchanan Geo., 19 Birchline Lane, London, E. C.	6
Reiceland Brown & Co., Cleveland, O.	6
Coddington T. B. & Co., 25 Cliff, N. Y.	4
Cookin & Huerstel, 99 Market Slip, N. Y.	4
Davidge & Wheeler, 78 Pine, N. Y.	4
Fuller, Lord & Co., 139 Greenwich, N. Y.	4
Fuller, Dana & Fitz, 10 North, Boston.	2
Gardner Wm., 575 Grand, N. Y.	4
Hall, Kimbark & Co., Chicago.	4
Harrison & Gilson, 508 & 502 Water, N. Y.	4
Jackson & Chase, 306 and 308 Franklin, N. Y.	4
Judson B. F., 457 and 459 Water, N. Y.	4
Matthews Chas. W., 133 Walnut, Phila.	4
Packard, Goff & Co., Youngstown, O.	4
Piersons & Co., 24 Broadway, N. Y.	4
Pope Thos. J. & Bro., 292 Pearl, N. Y.	4
Richards D. W. & Co., 92 Mangin St., N. Y.	4
Swan John E. & Bros., Glasgow, Scotland.	4
Smith Gam'l G. & Co., 343 Pearl, N. Y.	4
Warner A. B. & Son, 28 & 30 West, N. Y.	4
Williamson James & Co., 69 Wall, N. Y.	4
Whitney Alfred R., 58 Hudson, N. Y.	4

Iron, Manufacturers of.	
Atwater, Wheeler & Co., New Haven, Conn.	6
Britannia Iron Works, Middleboro', Eng.	6
Max Iron Works, Troy, N. Y.	6
Cartwright, McCurdy & Co., Cleveland, O.	6
Cleveland Rolling Mill Co., Cleveland, O.	6
Coffin Wm. E. & Co., 8 Oliver, Boston.	6
Elizabeth Iron Co., Elizabethport, N. J.	6
Ellis W. R. Co., 17 Battery, Boston.	6
Everson, Graft & Macrum, Pittsburgh, Pa.	6
Fulton, S. & Co., 412 Walnut, Phila.	6
Jones & Laughlins, Pittsburgh, Pa.	6
Leonard John, 450 & 451 Lynchburg, Va.	6
Grinchburg Iron Works & Co., Lynchburg, Va.	6
Milwaukee Iron Co., Milwaukee, Wis.	6
Niles Iron Co., Niles, O.	6
New Haven Rolling Mill Co., New Haven, Conn.	6
Onondaga Iron and Nail Works Co., Richmond, Va.	6
Oxford Iron Co., 81 Washington, N. Y.	6
Phoenix Iron Co., 410 Walnut, Phila.	6
Rowland, Wm. & H. reeve, Phila.	32
Iron, Hoop, Manufacturers of.	
Wm. Clark & Co., Pittsburgh, Pa.	4</

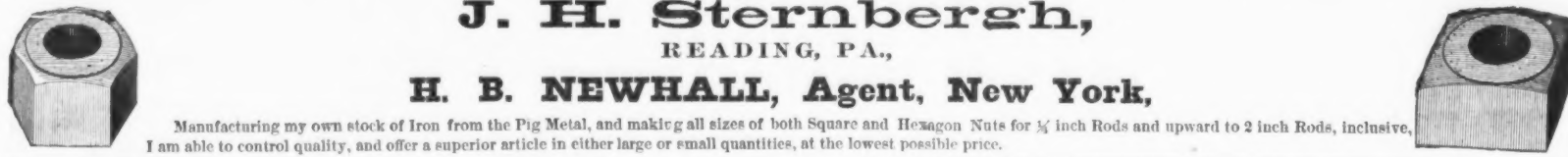
No. 11 Warren Street, NEW YORK.



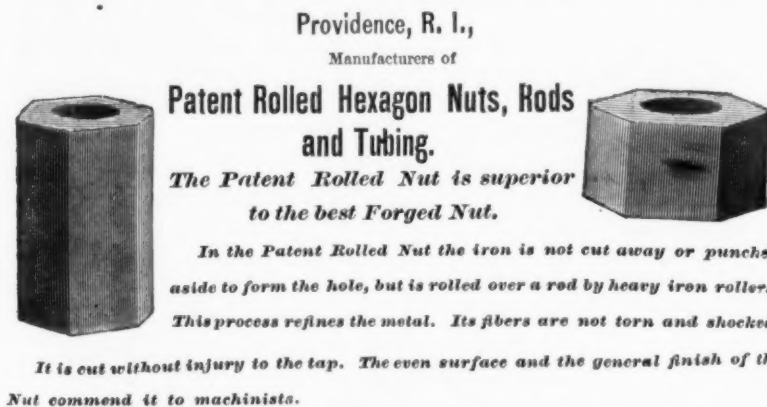
PROVIDENCE TOOL CO.,
Providence, R. I.,
Manufacturers of
SQUARE AND HEXAGON COLD AND HOT PRESSED NUTS, PICKS, BOLT ENDS, TURN
BUCKLES, CHAIN LINKS, ICE CHAIN, FAST AND LOOSE JOINT RINGS.
Providence
Clothes Wringer.
Reliance
Clothes Wringer
SHIP CHANDLERY
OF
All Descriptions.
Warehouses,
11 Warren, St. N. Y.
H. B. NEWHALL, Ag't.



WM. H. HASKELL & CO.,
Pawtucket, R. I.,
Manufacturers of
Machine and Plow Bolts,
Coach Screws, Set Screws & Tap Bolts.
Warehouses, No. 11 Warren Street, New York.
H. B. NEWHALL, Agent.

No. 11 Warren Street, NEW YORK.
READING HOT PRESSED NUT WORKS.


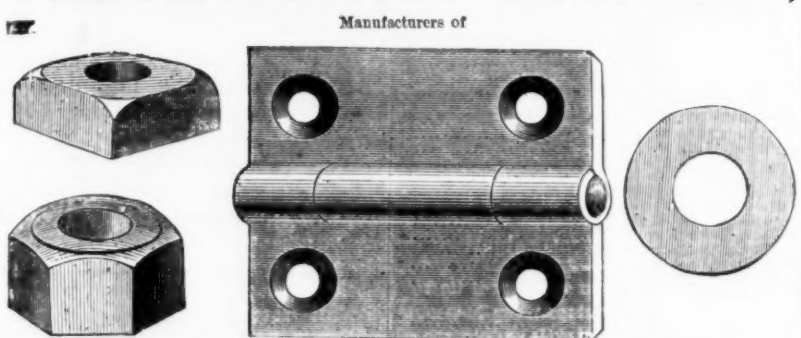
J. H. Sternbergh,
READING, PA.,
H. B. NEWHALL, Agent, New York,
Manufacturing my own stock of Iron from the Pig Metal, and making all sizes of both Square and Hexagon Nuts for 1/4 inch Rods and upward to 2 inch Rods, inclusive. I am able to control quality, and offer a superior article in either large or small quantities, at the lowest possible price.

No. 11 Warren Street, NEW YORK.
RHODE ISLAND NUT CO.,


Providence, R. I.,
Manufacturers of
Patent Rolled Hexagon Nuts, Rods
and Tubing.
The Patent Rolled Nut is superior
to the best Forged Nut.
In the Patent Rolled Nut the iron is not cut away or punched
aside to form the hole, but is rolled over a rod by heavy iron rollers.
This process refines the metal. Its fibers are not torn and shocked.
It is cut without injury to the tap. The even surface and the general finish of the
Nut commend it to machinists.

Warehouses, No. 11 Warren Street, New York.
H. B. NEWHALL, Agent.

LEWIS, OLIVER & PHILLIPS,
MANUFACTURERS OF
Merchant Iron & Heavy Hardware,
Carriage, Machine, Square Head, Bridge and Skein
BOLTS,
Nuts, Washers and Coach Screws, Harrow Teeth, Plow Handle
Extension Rods, &c.
Bolts, Spikes & Wrought Iron Shapes,
For BRIDGES, DAMS, PIERS, BREAKWATER and other permanent structures, made promptly
at a small advance in price of iron.
FOUNDATION BOLTS FOR DAMS, with ends slit by machinery.
Hook and Eye, Screw Hook and Strap, and Strap and T Hinges.
Originators and Patentees of their new line of
WAGON HARDWARE,
Comprising Patent Wagon Box Strap Bolts and Wrought Iron Bolster Plates, Large Head Wagon Rivets,
Neck Yoke Eyes, King Bolts, Box Rods, Rubber Plates, Axle Bolts, Queen Bolts, Tongue Cap, Sand
Band, Single Tree and other Labor Saving odd shapes of Iron. Send for Prices to
LEWIS, OLIVER & PHILLIPS,
91 and 92 Water Street and 114 and 116 First Avenue, PITTSBURGH, PA.
Or H. B. NEWHALL, Agent, 11 Warren St., New York.

THE ÆTNA NUT COMPANY,


Manufacturers of
Machine Forged & Hot Pressed Nuts,
Washers, Bolts, Wrought Narrow Butts, Table and Trunk Hinges,
Fellow Plates, Axle Clips, Wrought Clip Yokes, Rivets and Burs.

We desire to call your attention to our **MACHINE FORGED NUTS.** They are made from
extra quality of Iron, combining lightness and strength, and are especially well adapted for Agricultural Ma-
chines and Carriage Work.
Our **WASHERS** are made on improved machines—making them perfectly flat, smooth and true,
and are warranted superior to any in market.WAREROOMS: No. 97 Chambers & 79 Reade Sts., N. Y.
C. L. CAMPBELL, Agent.


ARMS, BELL & CO.,
Manufacturers of
Carriage, Tire & Square Head
Bolts.
Cold Pressed Nuts and Washers, Etc.,
YOUNGSTOWN, OHIO.
Price lists sent on application.



Susceptible
OF
32 Changes.
The Best Black Walnut Alarm Drawer
in the Market.
The Hardware Trade is rapidly entering into its
sale. A full sized drawer on brackets, for counter
sample, will be furnished; should an order follow,
wholesale prices only will be charged for sample.
We sell only to the Trade.
TUCKER & DORSEY
Indianapolis, Ind.
American Rolled Nut and Tube Co.,
RICHMOND, VIRGINIA.
NUTS
From 1/4 to 3 inches, hollow shafting, turnbuckles,
&c., manufactured by Ostrander's celebrated pro-
cess. Far better and 30 per cent. cheaper than any
others made. Send for circular.
Wm. E. Tanner, President.



Great Improvement in
LAWN MOWERS.
The most simple and easy
running Lawn Mowers made.
All who need a Lawn Mower, either for
a small or large lawn, should examine
the merits of Walker's Patents, **Empire**
and **Monitor.** They are simple in
construction and very light, not fatiguing
the operator.
Send for Circular.
Price of Empire, \$20.00. Price of Monitor \$15.00.
Agents wanted in every Town.

MANUFACTURED BY
BARLOW & WALKER, Sing Sing, N. Y.
Agents in Cincinnati, HOWELL GANO & CO.
Agents in Chicago, HOVEY & CO.
Agents in Boston, RUBIER & CO., 33 Exchange Street.**DISCOUNT SCREW LIST,**
(COPYRIGHTED)Showing Net Prices, Revised List, April 1, 1873,
at Thirteen Different Discounts, viz:25, 30, 33 1-3, 35, 40, 40 and 5, 45, 45 and 5, 50, 50 and 5,
55, 55 and 5, 60.This Table has been compiled with great care, and can be relied
on as perfectly correct.
It will save time and money, and prove invaluable to any Book-
keeper or Salesman in the Hardware Trade.
Sent by Mail, prepaid, on receipt of price.
On fine Cardboard, 9 1/2 x 15, single copy - - \$1.00.
Two or more - - - - - 75 cts. each.ADDRESS
FRANK DAYTON,
care CHARLES PARKER, 83 & 85 Duane Street, N. Y.
P. O. Box, 3107.From The Iron Age, June 6th.
The "Discount Screw List," showing the net prices of each size at thirteen different discounts, is a useful thing
to every hardware man to have. By use of it a merchant can mark both cost and selling price, without figuring
the discount on each gross, as is otherwise necessary; and he is not liable to the mistakes likely to be made in
hurried computations. The price is one dollar—a reasonable price when the amount of labor required in its prepa-
ration is considered. Address Frank Dayton, care Charles Parker, 83 and 85 Duane Street, New York.**Metallurgical.****MAYNARD & VAN RENSSLAER,**
CONSULTING
Mining and Metallurgical
ENGINEERS,
Experts in Iron and Analytical Chemists.
24 Cliff Street, NEW YORK.
George W. Maynard. Schuyler Van Rensselaer.**DROWN & CORLISS**
Analytical Chemists
And Consulting Metallurgists,
1123 Girard Street, Philadelphia.
THOMAS M. DROWN. GEORGE F. CORLISS.**BOYD ELIOT, Mechanical Engineer,**
34 Beach St., near Hudson, N. Y.
Patents Solicited, Extended and Negotiated. Expert
Witness in U. S. Courts.
Refers to Hon. S. B. Fisher, late Commissioner of
Patents, Cincinnati, O.; Geo. Gifford, Counselor in
Patent Causes, 31 Beach St., N. Y.; James S. Grinnell,
Chief Clerk of Patent Office, Washington, D. C.; Geo.
Harding, Esq., Counselor in Patent Causes, Philadel-
phia, Pa.; and to all the patrons of the Am. Patent Co.
and Sci. Artizan.**Henderson's Patent Iron.**The "Purified Cast Iron" costs but about
\$6 per ton more than common coke Pig Iron, and
when mixed with one-half wrought iron makes good
Cast Steel. The Wrought Iron from common coke
Pig Iron makes Cast Steel equal to that made from
the best Swedish Bar Iron.
The "Common" Bar Iron from common coke
Pig Iron is stronger, softer and tougher than Low-
moor Iron.
The "Common" Boiler Plates from ordinary
coke Pig Iron are stronger, 50 per cent. softer and
100 per cent. tougher than Lowmoor Iron.
For Licenses to make this Iron apply to
JAMES HENDERSON,
30 Broadway, NEW YORK.**The Iron-Masters' Laboratory.**Exclusively for the Analysis of Ores of Iron,
Pig and Manufactured Iron, Steels, Limestone,
Clays, Slags & Coal for Practical Metal-
lurgical Purposes.
No. 339 Walnut Street, Philadelphia.
J. BLODGET BRITTON.This Laboratory was established in 1866, at the instance
of a number of practical Iron-masters, expressly to afford
prompt and reliable information upon the chemical com-
position of the substances above mentioned, for smelting
and refining purposes. The object being to make it at
once a convenient, practically useful, and comparatively
inexpensive adjunct to the Furnace, Forge and Rolling
Mill.

CHARGES TO IRON WORKS.	
For determining the per cent. of pure Iron in an ordinary Ore.....	\$4 00
For the per cent. of Pure Iron, Sulphur and Phosphorus in do.....	12 50
For each additional constituent of usual occurrence.....	1 50
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.	
For determining the per cent. of Sulphur and Phosphorus in Iron or Steel.....	12 50
For each additional constituent of usual occurrence.....	4 00
For the per cent. of Carbonate of Lime, and Insoluble Silicious Matter in a Limestone.....	10 00
For each additional constituent.....	2 00
For the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal.....	12 50
For determining the constituents of a Clay, Slag, Coke, or of an Ash of Coal the charges will correspond with those for the constituents of an ore.	
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.	
Printed instructions for obtaining proper average samples for analysis furnished upon application.	

SCHOOL OF MINES,
COLUMBIA COLLEGE,
East 49th Street, NEW YORK.FACULTY:
F. A. P. BARNARD, S. T. D., LL. D., President.
F. E. LESTON, JR., E. M., Mineralogy and Metallurgy.
FRANCIS L. VINTON, E. M., Mining Engineer.
C. F. CHANDLER, Ph. D., Analytical and Applied Chemistry.
JOHN TORREY, M. D., LL. D., Botany.
CHARLES A. JOY, Ph. D., General Chemistry.
WILLIAM G. FECK, LL. D., Mechanics and Mining Surveying.
JOHN G. VAN AMRINGE, A. M., Mathematics.
OGDEN N. ROOD, A. M., Physics.
JOHN S. NEWBERRY, M. D., Geology and Palaeontology.
The plan of this school embraces a three years' course for the degree of ENGINEER OF MINES, or BACHELOR OF PHILOSOPHY.
For admission, candidates for a degree must pass an examination in Arithmetic, Algebra, Geometry and Plain Trigonometry. Persons not candidates for degrees are admitted without examination, and may pursue any or all of the subjects taught. The next session begins October 2nd, 1871. The examination for admission will be held on June 22nd and September 29th, 1871. For further information and catalogue, apply to
DR. C. F. CHANDLER,
Dean of the Faculty.


The Kinney & Co.
VICKSBURG, MISS.
ESTABLISHED 1852. RE-ESTABLISHED 1865.
BOTTOM FIGURES TO THE TRADE





A. & E. H. SEDGWICK,
MANUFACTURERS OF
Cheese, Butter and Flour Tryers,
MECHANICS TOOLS,
GARDEN IMPLEMENTS, &c., &c.
POUGHKEEPSIE, N. Y.






Send for Illustrated Catalogue and Price List.


DIRECTIONS
FOR USING

L. B. Taylor's Patent Speed Indicator.



To ascertain the number of revolutions made by a shaft in any given time: Take the Indicator by the handle in the right hand, holding your watch in the left, press the point of the spindle gently against the end and center of the shaft. To every hundred revolutions of the shaft the Hundred Pointer will make one revolution, while the Thousand Pointer will indicate one number, the dial being marked into ten parts. It may be applied to a shaft revolving either to the right or left.

Manufactured only by **CONN. CUTLERY CO., NAUGATUCK, CONN.,**
TO WHOM ALL ORDERS SHOULD BE ADDRESSED.



DOORS, SASHES, BLINDS,
Wood Mouldings, Stair Rails, Newels,
and all kinds of Fancy Glass.
Large Stock. Lowest Rates.
ORDER WORK SOLICITED.
Send for estimate and price lists.
KEOGH & THORNE,
254 & 256 Canal St.,
NEW YORK CITY

PYROMETERS
for BLAST FURNACES.

E. BROWN'S STANDARD PORTABLE,
E. Brown's Improved
Gauntlet



Edw. BROWN,
311 Walnut St., Philadelphia.

PYROMETERS
For Baker's Ovens, Boiler Flues,
Galvanizing Baths, Oil Stills, Vul-
canizers, Superheated Steam.
E. Brown's Portable Blast Gauge
for the plug hole, Steam Gauges,
Blast Gauges, Mercury Gauges,
Recording Steam Gauges, Engine
Counters, Indicators for ascertain-
ing the Horse Power.



Over 200 Gauntlets and 60 Port-
able Pyrometers are now in use at
Blast Furnaces.
Circulars on application.

BIRMINGHAM, ENGLAND
SAMUEL A. GODDARD & CO.,
Commission Merchants and General Agents,
execute orders for British manufactures on the lowest
terms, and collect and forward goods for a very mod-
erate payment. Agents for the sale of North Staf-
fordshire Iron of a standard quality.

SARGENT, GREENLEAF & COLE,
300 Broadway, New York,
Manufacturers of

PAD LOCKS,
Drawer, Trunk, House,
STORE DOOR AND OTHER LOCKS,
NIGHT LATCHES, &c.,
with Small Flat Keys. Also
BANK and SAFE LOCK

Send for Price List.



1816.
H. F. F.

1844.
H. F. F. & Son.


1850.
P. A. F.

1868.
P. A. F. & Co.

PETER A. FRASSE & CO.,
95 Fulton Street, New York,
IMPORTERS OF

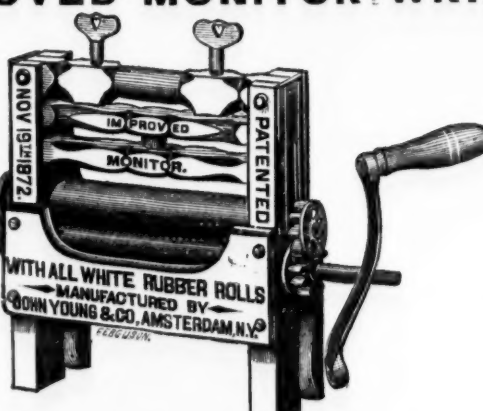
Stubs' Steel Wire, Files and Tools,
Grobet Swiss Files,
Extra Quality English Spring Steel Wire,
Nos. 1 to 34.
Steel Wire for Sewing Machine Needles and for other Purposes,
French Cold Rolled Sheet Steel,
Sizes, 22 to 36 Gauge.
Jewelers', Engravers' & Mechanics' Tools.
The only Agents in the United States for
HUBERT'S CELEBRATED FRENCH EMERY PAPER.
For Hatters' and Machinists' Use.

Greenfield Tool Co.,
Sole Manufacturers of
PARKER'S PATENT
FORGED OX SHOES,
And the "DIAMOND" Stamp of Extra
Cast Steel
Plane Irons.
Also, Bench & Moulding Tools
of every description, Polished Planes
in Sets, Plates, Stops, Cuts, &c.,
&c. Drop and Hammer For-
gings, to order.
Address, for Illustrated Catalogue and prices,
GREENFIELD TOOL CO.,
Greenfield, Mass.
Warehouse in New York, 37 Chambers Street.




IMPROVED MONITOR WRINGER.

WITH
Cog Wheels
AT
Both Ends
OF THE
ROLLERS.
Sold by
HARDWARE
AND
Woodware
Dealers
Everywhere.




In Use the
Monitor
Roller
is
Warranted
not to turn on the
SHAFT.

Manufactured by **JOHN YOUNG & SONS,**
RUSSELL & ERWIN MFG. CO., 45 & 47 Chambers St., General Agents, N. Y.



C. W. PACKER'S
PATENT



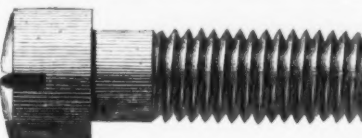
ICE CREAM FREEZERS.

A large number of Testimonials might be offered in recommendation of these Freezers, but the fact that they are sold by the leading houses in all the principal cities in this country, and also numbers of them are exported every year, is a sufficient guarantee of their excellence. No expense is spared to render them perfect, and recently improvements have been introduced in their manufacture, by which increased strength, durability and neatness are secured. They are made in the most substantial manner—none but the best materials are used in their construction, and the mechanical arrangements are such that they will freeze Cream, Fruits or Water Ices in the shortest possible time.


DOUBLE-ACTION FREEZER.		COG-WHEEL FREEZER.	
SIZES AND PRICES.		SIZES AND PRICES.	
10 quarts.....	\$15 00	2 quarts.....	\$3 50
15 " " " " " "	25 00	3 " " " " " "	4 50
25 " " " " " "	30 00	4 " " " " " "	5 50
		6 quarts.....	\$ 7 00
		8 " " " " " "	8 00
		10 " " " " " "	9 00
		15 " " " " " "	15 00

For sale in New York at minimum rates by Wholesale Dealers in House Furnishing Goods generally.
CHAS. W. PACKER, Manufacturer, Philadelphia.

FLUTING MACHINES,
PIANO STOOL SCREWS.
LOWERRE & TUCKER, 23 Railroad Place, Newark, N. J.
Send for Price List.



TURNED
MACHINE SCREWS,
One-sixteenth to five-eighths diameter.
Heads and points to sample.
IRON, STEEL and BRASS.
Lyon & Fellows Mfg. Co.,
Cor. 1st and North 3d Streets, Williamsburgh, N. Y.



WANTED, BOOK AGENTS
FOR THE
FUNNY SIDE OF PHYSIC.
800 Pages, 250 Engravings.
A startling expose of Medical Humbugs of the past and present. It ventilates Quacks, Impositors, Traveling Doctors, Patent Medicine Vendors, Noted Female Cheats, Fortune Tellers and Mediums, and gives interesting accounts of Noted Physicians and Narratives of their lives. It reveals startling secrets, and instructs all how to avoid the ills which flesh is heir to. We give exclusive territory and liberal commissions. For circulars and terms address the publishers,
J. B. BURR & HYDE, Hartford, Conn., or Chicago, Ill.
AGENTS WANTED FOR THE

GREAT INDUSTRIES OF THE UNITED STATES.
1300 Pages and 500 Engravings, printed in English and German, written by 30 eminent Authors, including John B. Gough, Hon. Leon Case, Edward Howland, Rev. E. Edwin Hall, Philip H. Ripley, Albert Brisbane, Horace Greeley, etc. This work is a complete history of all branches of industry, processes of manufacture, etc., in all ages. It is a complete encyclopedia of arts and manufactures, and is the most entertaining and valuable work of information on subjects of general interest ever offered to the public. We give our agents exclusive right of territory. One of our agents sold 130 copies in eight days, another sold 368 in two weeks. Our agent in Hartford sold 367 in one week. Specimens of the work sent to agents on receipt of stamp. For circulars and terms to agents address the publishers,
J. B. BURR & HYDE, Hartford, Conn., or Chicago, Ill.
AGENTS WANTED FOR THE

Uncivilized Races of Men in all Countries of the World.
Giving a Comprehensive account of their Manners and Customs, and of their Physical, Social, Mental, Moral and Religious characteristics. By REV. J. G. WOOD, M. A., F. L. S.
5 (1 Engravings, 1500 Super Royal Octavo Pages. In two Volumes, or two volumes in one.
Agents are making over \$100 per week in selling this work. An early application will secure a choice of territory. For terms address the publishers, **J. B. BURR & HYDE, Hartford, Conn., or Chicago, Ill.**

CHALLENGE
DOOR & GATE SPRING.



PATENTED
JULY 11th 1871.

CHALLENGE
DOOR & GATE SPRING.



PATENTED
JULY 11th 1871.

BROWN, HARRIS & HOPKINS,
Hardware Merchants,
and Manufacturers of the

CHALLENGE
DOOR & GATE SPRING.



PATENTED
JULY 11th 1871.

CHALLENGE
DOOR & GATE SPRING.



PATENTED
JULY 11th 1871.

The Challenge Springs are manufactured from Steel Wire, tempered by an Improved Process, the result of repeated experiments, and must not be classed by dealers with the numerous worthless "Coil Springs" made from common Red Spring Wire.
Nos. 180 Greenwich and 58 & 60 Dey Sts., NEW YORK.

E. M. CHAPIN,
MANUFACTURER OF
RULES, PLANES, GAUGES,
Levels, Hand and Bench Screws, etc., etc.
Established in 1826 by H. Chapin.
Manufacturing Address, **H. CHAPIN'S SON,**
PINE MEADOW, CONN.

CROOKE & CO.,
MANUFACTURERS OF
WROUGHT IRON BUTTS,
All our goods are manufactured from patent faced iron plates; they have a smooth face and bright finish.
163 & 165 Mulberry Street, New York.

DESIGNING AND ENGRAVING
ON WOOD
52 JOHN ST. **H. R. WHITE** NEW YORK.

The Iron Age.

New York, Thursday, April 10, 1873.

DAVID WILLIAMS . . . Publisher and Proprietor.
JAMES C. BAYLES . . . Editor.
JOHN S. KING . . . Business Manager.

The Iron Age is published every Thursday morning, at No. 10 Warren Street, New York, on the following terms:

SUBSCRIPTION.

Regular Weekly Edition . . . \$4.00 a year.
Semi-Monthly . . . 2.00 "
1st and 3d Weekly Nos. in each month.
Monthly . . . 1.00 "
1st Weekly No. in each month.

ADVERTISING.

One square (12 lines, one inch), one insertion, \$2.50;
one month, \$7.50; three months, \$15.00; six months
\$25.00; one year, \$40.00; payable in advance.
All communications should be addressed to

DAVID WILLIAMS, Publisher,
10 Warren St., New York.

City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*; also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

REMOVAL.

THE OFFICE OF

THE IRON AGE

Has been removed to

10 Warren St.,

New York, three doors from Broadway.

CONTENTS.

First Page.—The Refining of Iron in the English Furnace. Joining Band Saws. A New Plan for Single Rail Railways. The Wilmington Boiler Explosion. Telegraphic Consolidation. A New Mitrailleur.
Third Page.—New Patents. The St. Louis Bridge. Mineral Resources of Kansas.
Fifth Page.—The Minerals of New Jersey.
Seventh Page.—The Proposed Lifting Bridge at Middleborough. Phosphorized Bronze. A New Fleet of Merchant Ships.
Ninth Page.—Business Items.
Thirteenth Page.—The Iron Age Directory.
Sixteenth Page.—End of the Great Welsh Strike—A Story With a Moral. Making Gas Without Coal. The Lesson of the "Atlantic" Disaster. The Gilbert Elevated Railway. Scientific and Technical Notes.
Seventeenth Page.—Nevada Mining Machinery. The Chinese Sensation at Beaver Falls.
Eighteenth Page.—Trade Report.
Nineteenth Page.—Trade Report (concluded). Our English Letter.
Twenty-third Page.—New York Wholesale Prices of Hardware and Metals.
Twenty-fourth Page.—New York Wholesale Metal, etc., Prices (concluded).
Twenty-seventh Page.—Philadelphia, Pittsburgh, Boston, Buffalo and Chicago Hardware and Metal Prices.
Twenty-ninth Page.—Chicago, Cincinnati, St. Louis and London Hardware and Metal Prices.

End of the Great Welsh Strike—A Story With a Moral.

It is to be hoped that the deluded trade unionists of this and other cities, who contemplate taking part in the threatened general strike for the eight hour system, will spend a few moments of their earliest leisure in reading the story of the great strike in South Wales, and meditating upon the moral which that story naturally suggests. The facts are, briefly, as follows: Early in December last the Welsh coal and iron masters gave notice of a reduction of ten per cent. in wages, after the beginning of the New Year, in accordance with the terms of the existing "basis," which authorized the masters to increase or decrease wages, according to the average price of iron for the quarter preceding. As long as the tendency of wages was steadily upward the men were satisfied, but when it came the masters' turn to profit by the "basis," the men gave notice that they would not accept the reduction. A conference was then held, at which the masters produced abundant proof that they were entitled to make the reduction proposed, but the men, having no case, demanded that the whole question should be submitted to a board of arbitration for adjustment. To this the masters would not accede, claiming that there was nothing to arbitrate upon, and that, as the principle of arbitration had utterly failed in the North of England, there was no reason to expect any better results of it in South Wales. The rejection of this plausible and always popular expedient furnished the men a sufficient pretext for a strike, and one was accordingly declared. From forty to sixty thousand workmen either abandoned their work or were forced to stand idle because of the withdrawal of the union men from the trades which the unions controlled, and it was generally understood that the men would contest the question of the proposed reduction to the end, cost what it might. The unions were strong, their treasure

were well filled, and outside assistance had been promised. The masters, on the other hand, were resolute and united, and as it was generally understood to be a test issue, both parties prepared for a long contest, each confident of success.

Of the events which happened between the beginning of this great strike and its ending, we have not space to speak in detail. Those who had undertaken to support their families upon the pittance doled out to them by the unions, found that they had brought those dependent upon them to misery. The outside assistance was not to be depended upon, and the greatest distress prevailed throughout the entire district. Families lived upon credit as long as credit was allowed at the stores, and then they lived upon charity in hunger and cold. The whole community, so lately in the enjoyment of unexampled prosperity, was impoverished, and many instances are reported in which families were kept from starvation only by the open handed liberality of the masters, whose losses, though heavy, did not harden their hearts to the misery around them. Well, the strike lasted about eleven weeks, and then came to an end, as we predicted it would, in the unconditional surrender of the men without any reference to the official action of the unions. They had lost everything they had to lose, and gained only the knowledge derived from bitter experience, and from the humiliating consciousness that they had been made fools of by demagogues who had gained control of the unions. The organs of the unions accept the issue in silence: not so the men. Their joy at the prospect of once more earning their old wages has found vociferous expression in public demonstrations, processions, banners, brass bands and blank cartridges. The result is hailed with delight throughout all Great Britain; but the true cause for rejoicing is not so much in the fact that the masters have triumphed over the men, as that the men have triumphed over the unions, which strove to the last to prolong the strike. The men did in the end what they should have done in the beginning, and asserted their independence of the few adroit agitators who had condemned them to a prolonged idleness and misery. They did not want to strike in the first place; it was the unions, or, rather, the professional agitators controlling the unions, who crowded them into it: and while these mischief makers will, doubtless, continue to ply their trade as a means of livelihood, it will probably be many years before they will again find in South Wales a promising field of operations.

To the American workman this story is not without special present interest. Had the men gained what they struck for, their losses in gaining it would have far exceeded the utmost possible advantage sought. Our intelligent workmen do not need to be told how perfectly this accords with their own experiences in the past, and if they are determined to repeat this spring the mad folly of an eight hour strike, they must expect, like the miners and iron workers of South Wales, to learn from defeat and discomfiture the unprofitableness of making war upon their own interests under the leadership of their worst enemies, the professional agitators.

Making Gas Without Coal.

If all that we are told about Ruck's new process of gas manufacture be true, it may be accepted as showing that it is not safe to pronounce any idea impracticable because repeated attempts to apply it have ended in failure, or, more properly, come short of success in some important particular. So many attempts have been made during the past few years to manufacture illuminating gas by decomposing water, separating the oxygen from the hydrogen, and carbonizing the latter by means of petroleum or some other bituminous product, that we were not disposed to accept without question even the testimony of our intelligent English correspondent that the process had been economically applied on a large scale in the manufacture of cheap gas for heating and illuminating purposes. But the statement has been so abundantly confirmed that we no longer have any good reason to doubt its truth, or to believe that the inventor has succeeded in imposing upon the scientific authorities and experts who have examined his process in all its details. Mr. Ruck's system, which is now in practical application at the Battersea Park gas works, is certainly cheap and simple. The hydrogen is obtained by passing steam through a retort filled with incandescent coke, with which scraps of old iron have been mixed. The oxygen of the steam attaches itself to the iron, forming scales of black rust, and the hydrogen passes into the purifying chamber, carrying with it a small percentage of carbonic acid, carbonic oxide, and certain sulphurous vapors, which are entirely removed by passing through oxide of iron in the purifying chamber. The gas, which is nearly pure hydrogen, is then ready for use for heating purposes, burning with a pale

flame streaked with a few green lines indicating the presence of carbonic oxide. In this form the gas is said to cost 7d. per 1000 feet—an amount sufficient, if economically employed, to vaporize 50 gallons of water—and can be used in any form of stove or heating apparatus adapted to common carbonized hydrogen gas. To adapt it to illuminating purposes it is made to pass through refined petroleum of a specific gravity of about .680, which is said to impart to it a luminosity equal to 16½ candle power, in an argand burner, with a flow of about five cubic feet per hour. In this form the gas is said to cost only 1s. 8d. per 1000 feet, or a little more than one-half the cost per 1000 feet of the ordinary coal gas consumed in London and other English cities, with coal at 26s. per ton. To bring the hydrogen up to a good standard of luminosity requires the volatilization of one and one-half gallons of petroleum per 1000 feet, but by this means the volume of the gas is increased about 8½ per cent.

Regarding the permanency of this gas we have the most abundant and satisfactory testimony. *Nature*, a high scientific authority, and beyond the reach of influences calculated to warp the judgment of its conductors with regard to an invention of this character, states that several experiments at low temperatures have demonstrated that it loses nothing of its heating or illuminating power by being conducted for long distances through pipes; and if this be true, Mr. Ruck may be said to have overcome the great difficulty which has interfered with the success of all previously invented processes designed to accomplish the same results. Indeed, there seems to be nothing lacking to insure the success of the process. The works at Battersea, which are large enough to supply a town of 4000 inhabitants, occupy but little more space than would be needed to accommodate an engine of 20 or 30 horse power, and only about 3 per cent. of the hand labor required in the manufacture of coal gas is needed in the new process. The charges of coke and scrap iron in the retorts do not need to be removed—at least in works the size of those at Battersea—often more than once in five or six weeks, and the quantity of either material needed is not great.

As so many inventors have previously claimed the discovery of practicable processes of making gas from water, it is natural to regard with some suspicion the unqualified approval which *Nature* and other leading English scientific and technical journals have given Mr. Ruck's process; but the high sources from which the above facts are obtained, entitle them to respectful consideration. If too much is not claimed for it, the invention is one of great practical importance, and may be regarded as the first and most promising of the great economies to result from the coal famine from which the English people are now suffering so severely. If there is anything in the invention it will not be long in finding its way to this country, bringing with it the promise of cheaper and better gas than that now furnished by the companies who have held their profitable monopoly so long, but against whom a popular feeling now exists which will not be ultimately unproductive of results beneficial to consumers.

The Lesson of the "Atlantic" Disaster.

The terrible fate of the steamer *Atlantic* has given rise to a discussion so comprehensive, thorough and generally intelligent, that but little remains to be said. The official investigation into the causes of the disaster will show where the responsibility rests, and it is to be hoped that those who are to blame will be held to a strict accountability. That the captain was guilty of negligence is evident, from the fact that he left the vessel in charge of a subordinate at a time when, if ever, he should have exercised the keenest vigilance; but he is not alone to blame. Had the ship been properly supplied with coal and provisions she need not have put into Halifax at all, and if the statements made before the investigating committee are trustworthy, the agents of the line in Liverpool are deserving of the severest censure, if nothing more.

We are not, however, so sanguine as to believe that the investigation, however thorough or long protracted it may be, will result in reforming even the least of the evils of steamship management, by which the lives of ocean travelers are now imperiled. The captain of the ill-fated *Atlantic* may be dismissed in disgrace, or even suffer a worse fate, the agents and owners of the line may be censured, and there the matter will end.

What protection, then, have ocean travelers against accidents resulting, as in the case of the *Atlantic*, from preventable causes? So far as courts of inquiry and law making bodies are concerned, none at all. Laws cannot be framed which will reach those who are responsible, primarily, for the departure of ships from port under command of incompetent or unfaithful officers, and to punish such officers for accidents resulting

from their negligence or ignorance, neither repairs the mischief done nor tends to prevent like mischief in the future. The remedy, if there be any, lies with the traveling public. If the owners of a line of ships knew that such an accident as that which has befallen the *Atlantic* would drive their business to other lines, they would neglect no precaution, however costly, to guard against accident. Their vessels would be placed under the command of the best officers that money could hire, and fidelity would be so rewarded that every man in their employ would have a constant stimulus to the intelligent performance of his whole duty. If, on the other hand, the public are the first to forget that the safety of life is less a consideration with steamship owners than the saving of expense, and are as ready to patronize a line after one of its ships has been run ashore through the criminal carelessness of its commander as before; if they forget, as they are only too likely to do, that the *White Star* ships have been sent to sea so short of provisions that, had the voyage of the *Atlantic* been merely delayed a few days longer, and the passengers escaped the awful fate which befel them, they would have been in danger of starving to death; if they forget that, because coal is high, their ships are permitted to sail in March with no more fuel than would barely carry them across in July or August—if, forgetting all these things, they continue to patronize the line as fully and freely as before, there will be no reforms in its management, or that of its rivals. There are no considerations which appeal so strongly to the ship-owner or the railway manager as those which touch his pocket, and if they suffer from needless accidents in the immediate loss of business, they will not be slow to learn that an economy effected at the expense of safety to life does not pay.

The Gilbert Elevated Railway.

The business-like manner in which the projectors of the Gilbert Elevated Railroad have set about the great work undertaken by them, is the best indication they could give of a determination to give us the long-needed and oft-promised facilities for "quick transit." As long as the enterprise remained only a project, the people of the city could not be expected to feel any great confidence in assurances that "everything had been arranged," and that "work would be undertaken at once." We have heard this so often that it has become an old story, but we now have the assurance that the work is fairly begun. On the 24th of March a contract was signed by the officers of the New England Iron Company, for the construction of three miles of the road, to be finished by the 15th of October next. The section under contract, extending from Chambers street to 43d street, is to be a double track railway. The New England Company are privileged to sub-let any portion of the line, and they will have to avail themselves of this privilege to a considerable extent in order to complete the work within the time specified. It is one of the largest contracts for iron work ever made in this country, and we hope soon to obtain some interesting details of the amount of iron required in construction to lay before our readers. As it will require at least three months to get the iron work ready, construction must progress at the rate of one mile per month, and \$5,000,000 have been placed in the hands of trustees, to be paid out in monthly instalments as the work progresses. Whether the enterprise manifested by the officers of the Gilbert Road will have the effect of stimulating Mr. Vanderbilt, and other holders of charters for quick transit railroads, to redeem some of their many promises to the public, remains to be seen.

Scientific and Technical Notes.

Among the many useful improvements introduced of late years in connection with labor-saving apparatus for engineering construction may certainly be classed

THE GUN POWDER PILE DRIVER, brought out originally in this country, it was introduced into England some five years since, and its working has demonstrated that by its use a considerable saving is effected both in time and cost as against the ordinary method of pile-driving. The apparatus consists of an ordinary pile-driving engine having a ram, from the upper and underside of which a plunger projects. The ram is fitted with an arrangement by which it may be retained at any desired height above the pile head. A cast iron cap, having a hole in its centre into which the lower plunger of the ram will fit, is placed on the top of the pile to be driven, and in the hole is inserted a small charge of gunpowder. On the ram being released the lower plunger enters the hole in the cap and, compressing the air within, generates heat, which ignites the gunpowder. The force of the explosion is utilized partly in driving the pile downward, and partly in throwing the ram upward, the latter being detained at the required height ready for the next blow. Should the ram be thrown too high, the upper plunger enters an air cylinder, compressing the air and cushioning the blow. The charges of gunpowder were at first fed into the cap-piece by hand, but a self-acting feeding arrangement

was afterward added which still further simplifies its operation.

An experimental trial was made a few days ago with a

NEW PATTERN OF MARINE ENGINE, constructed by the Yorkshire Engine Co. under Perkins' patent. The important features of the invention consist in the increased safety due to the improved construction of the boilers, and in the great saving in the consumption of fuel consequent on the great expansion, by using steam at very high pressure—namely, from 250 lbs. to 4500 lbs. to the square inch—as compared with that usually adopted. There is, at the same time, greater security under this system, as the boiler is safe under a pressure of 3000 lbs., and works up to only one-eighth of its bursting pressure. There is a total absence of escape of steam, and lubricating by oil is dispensed with. Another important feature is the small quantity of water required to supply the waste, owing to the way in which the joints are constructed, these being always tight under the greatest pressure. In addition to these advantages, there may be mentioned the economy of space and weight which are in favor of this new system. The only question regarding which doubt is expressed is the utility of the invention for long sea voyages, as fresh water only is used in the boilers, distilled salt water even having been found to produce an injurious effect on the machinery. This is a question, however, which yet remains to be practically put to the test.

For some years past the attention of engineers and architects has been given to the construction of houses, wharves, and other works in concrete, and at the present time numerous examples of the successful application of the system are to be met with, both in London and the provinces. Among those who have labored to extend this method of building, and to improve its details, is Mr. Philip Brannon, who has succeeded in producing a combination of metal and cement which has been tested with very satisfactory results. This system of

WIRE CONCRETE as it is called, consists of a sustaining metallic framework or skeleton, upon which wires are strained, the whole being inclosed in the concrete materials forming the body of the structure. By this arrangement not only are the walls and floors of a building run up in concrete, but the doors, shelves, and other fittings are formed of the same material. Thus the strains in a building are equally distributed, and it is rendered fire-proof throughout, wood and other combustible materials being dispensed with. In order to obtain the utmost amount of cohesion throughout the mass, and to prevent cracking—especially where employed in doors or thin partitions—a certain proportion of fibrous material is worked up in the concrete. This system has been carried out in a house at Edmonton which was built by Mr. Brannon, and to which the test of fire has been applied on two occasions without producing any detrimental effect upon either the walls or fittings. Moreover, furniture was left in some of the rooms, and persons remained there while a brisk conflagration was going on in the lower apartments. Arrangements have been made for the construction of houses upon this principle in Islington, Battersea, and Camberwell, and negotiations are pending for the erection of several blocks of buildings in the north of England. The application of the wire concrete system to engineering works and sea-walls is proposed by Mr. Brannon. An example of its application to the latter purpose, in fact, already exists in the sea-wall of the esplanade at Shanklin, in the Isle of Wight. This work, however, was executed in 1869, before the invention had been perfected as regards the metallic framing. The walls as now arranged will form girders, and if undisturbed will remain suspended upon bearing points arranged at intervals beneath it. Mr. Brannon has prepared plans for a wall which is to be erected at Bradlington, and which will be three-quarters of a mile in length. The saving in cost which will be effected is said to be very great, in some cases as much as one-half of the ordinary cost of such structures. The wire concrete system is also applicable to pier work, and its inventor expects to have the construction of the Witlesea Pier. Another adaptation of the principle is for breakwaters. In this case bags of woven wire are used, being lined with concrete and filled with sand. They are placed in position before the concrete has perfectly set, and are well rammed down and concreted together. By this method Mr. Brannon proposes to convert the Yarmouth and Lowestoft banks into breakwaters, so as to form harbors of refuge.

Mr. Joseph Knott, proprietor of the Highfield Steel Works, has lately patented an INVENTION FOR ECONOMIZING FUEL AND PREVENTING SMOKE,

which consists of bringing together two atmospheric pressures which meet in the fire and create a perfect combustion. The first, an upward pressure, is obtained by means of a fan or blower, which enters the ash box underneath the fire bars. The front of the ash box and the furnace door are made perfectly air tight, and hence the blast from the fan is forced through the bars of the grate, and causes the fire to burn, thus giving a more intense heat than is obtained in the ordinary way. A back draught is produced by placing a damper on the top or in any part of the chimney; thus cutting off the ordinary draught caused by long chimneys. A pipe is put into the chimney just below the damper and extending downward for some 16 or 20 feet. The pipe is open at the bottom, thus allowing egress for the carbonic acid gas, which is the residuum of combustion. The upward draught from the fan must always be kept a little in excess of the back draught from the pipe, so that it will carry off the carbonic acid gas as soon as liberated. If the back draught were strongest the carbonic acid would be kept back, and would extinguish the fire. The

patent is applicable to steam boiler and other furnaces. A boiler fitted up on the new principle has been at work at the Highfield Steel Works for a fortnight, and has been carefully tested as to the quantity of fuel used as compared with the old principle. It has been first worked a day on the latter principle, the fuel weighed, and the engine carefully worked at a given pressure. It was found that 13 cwt. of coal were consumed per day. Then, it has been tested on the new principle at exactly the same pressure and doing the same work, and has only consumed eight cwt. of fuel in the day—thus showing a saving of 40 per cent. It is true the best was not made of the fuel under the old principle; but the patentee confidently anticipates that under any circumstances a saving of fuel of from 25 to 30 per cent. will be effected and all smoke prevented. When the fan is not working and the two pressures are not brought together, smoke is generated as usual; but immediately the fan is started the smoke that is in the flues is blown out in a few seconds, and no more is generated. It is necessary to feed the fire by means of a hopper, so as to do away with the necessity of opening the door. In the erection of new works in which this principle is adopted there is no necessity whatever for the construction of tall chimneys. The invention has been examined by a board of experts and pronounced upon favorably.

Nevada Mining Machinery.

BY JAMES A. WHITNEY, M. E.

I have in mind a night journey from the Green Truckee meadows to the desolate, sage-scrubbed hamlets of Virginia City and Gold Hills, or, as it was termed of old, Washoe. Here I descended the shaft, 1100 feet, of the Yellow Jacket silver mine, and passing into others gazed down inclines 300 feet more in depth. The most important engineering industry west of the Rocky Mountains, mining, has involved the use of strong and substantial, if not highly finished, machinery, of which a brief sketch, having reference to the locality specially just indicated, may be of interest to the readers of *The Iron Age*.

The shaft has an available transverse section of about six feet, and is walled with squared timber 14 inches thick; one course near the top but two courses toward the bottom to revert the mighty bulging pressure of the superincumbent rock. Two cages, in the Yellow Jacket, alternate up and down to afford access to the drifts and to lift the ore. These cages are made of wrought iron; each has two floors, one above the other, which doubles the capacity from 1400 to 2800 pounds per lift. Each cage is hung to a flat wire rope four inches wide and three-eighths of an inch thick, and with a breaking strength of 50 tons. These ropes run over sheaves nine feet in diameter, arranged over the shaft's mouth, and wind upon 14 foot reels driven by steam in hoisting; in the descent of the cages their gravity is allowed to actuate them, the speed being controlled by friction brakes applied to the drawing shaft. The ropes, the shafts and gearing are so proportioned and so arranged with reference to a registering device, that the exact position in the shaft of either cage may be seen by glancing at a suitably arranged dial and index-finger. An automatic alarm sounds when either cage is brought to within 100 feet of the surface; and a signal rope running to the bottom enables a person on the cage to communicate with the engineer to stop or start the engine, as circumstances may require, at whatever depth the cage may be. Concerning the wire ropes aforesaid, the method by which they are kept pliable and in good working order may be adopted to advantage for wire rope of all kinds used for other purposes, but is especially useful for the larger and more rigid kinds. The process is as follows:

A wooden trough two feet wide, two deep and twenty long, is half or two-thirds filled with hot tar, with which about five per cent. of tallow has previously been intimately incorporated. At each end of the trough is a drum about 24 inches in diameter, the rope being wound from one to and upon the other, thereby being drawn through the tar mixture. This is done slowly, to afford time for an attendant to scrub the surface thoroughly with a wire brush, which forces the material into the interstices of the rope. The ropes are treated in this manner once a month, and, aside from being kept flexible, are of course effectually protected from corrosion. I may mention, by the way, that it is to be regretted that no similar treatment is found efficacious in the protection of the air or ventilating pipes used in the mines, which are rapidly corroded by the water charged with an appreciable portion of sulphuric acid.

At intervals of 100 feet depth, the horizontal drifts of the different levels branch off, each laid with a miniature railway track, the rails exactly corresponding in form with the larger ones of a common railroad. On these run the flanged wheels of the wrought iron trolleys. The trolleys were formerly made of wood, but the substitution of iron has not only rendered them much more durable, but has diminished their weight about forty pounds apiece. The importance of this will be seen when it is understood that it represents a saving of eighty pounds lifted an average of a thousand feet at each and every hoist, two cars with their contents being carried at every upward movement of either cage. The incline, as a rule, is simply an extension of the vertical shaft at an angle of 45°, the inclination of the ledge. That which I saw in the Crown Point, adjacent to and communicating with, the Yellow Jacket, was, however, at an angle of 36°, and furnished with a track upon which ran a trolley actuated by a two inch hempen rope, in lieu of the flat wire one more commonly employed. The ore from the incline being drawn to the top by the car, was dumped into a re-

ceiver, from which it passed, through a chute, to the cars used in the levels. These, run upon the cages, were lifted to the surface, and then run out upon an elevated trestle nearly 300 ft. long, and with its outer end 50 ft. above the ground, and with a wooden receiver capable of holding 350 tons, immediately below. The cars are dumped singly, and the ore falls into the receiver. The bottom of this is made at an angle of 45°, which causes the mass to pitch toward chutes, through which, on occasion, it is passed into freight cars, by which the ore is transported to Carson, connected with Gold Hill by railway, and where superior facilities exist for milling. It is from Carson, 16 miles distant, that the wood used for fuel, and the timber, 16 inches square, employed for filling in the excavations left by the extraction of the ore, is brought. The track, as it reaches the Yellow Jacket, is sixty feet above the floor of the building above the shaft, and the fuel for the boilers has to be let down on an elevator having a vertical movement of that extent. The fuel is placed in a car at top, is then let down, and run out upon a track extending past and in front of the furnace doors, an arrangement that provides for the feeding of the furnaces in a most convenient manner.

The treatment of the ore, after it comes from the mine, is, as just indicated, ordinarily carried on at Carson, but there is a small, ten-stamp mill in the vicinity of the Yellow Jacket, which shows in detail the *modus operandi*. Two Chinamen, with long handled hammers, broke the material down to egg size to fit it for the stamp. These are substantially nothing but iron pestles, lifted and let fall one after another by cams, upon the rock placed in a strong metallic box provided below, and constructed with sieves at the end. Water flows in at one end and out at the other, carrying with it the finer particles, the coarser fragments being retained by the sieve. The water passes to a settling tank, where the fine particles collect as sediment, and are, in due time, transferred to the amalgamators. In these latter the floured mass is ground against an iron surface in contact with quicksilver, until the whole of the precious metal has amalgamated with the mercury. The amalgam and uncombined mercury sinks to the bottom and is drawn off by a syphon and put into a wash leather sack. This sack is subjected to pressure which forces out the free mercury through the pores, but retains the more solid amalgam within. The latter is then ready for transfer to the retort, which is a very simple contrivance, comprising merely a horizontal cylinder, situated over a furnace, and provided with a pipe at its near end, which pipe extending downward and passing in a coiled form through a trough of cold water, condenses the mercurial vapor as fast as it is expelled from the amalgam by the heat.

The Chinese Sensation at Beaver Falls.

After much talk, the people of Beaver Falls have reached a very sensible conclusion with regard to the employment of Chinese labor in the cutlery works at that place. The following is the end of the matter:

Response of the leading citizens of Beaver Falls to the answer and propositions of the Elders of the Harmony Society at Economy, Pa. We, the undersigned, property holders and citizens of Beaver Falls, do hereby accept the reply made by the Council of Elders of the Harmony Society in relation to the Chinese excitement at this place. From the well-known integrity of the Society, and their past aid to the people here, we are well assured that their promises in that reply will be faithfully performed. Every citizen here knows that the rise and prosperity of Beaver Falls is solely owing to the enterprise and liberality of the Economites; and we affirm the belief that the same liberal aid and enterprise will be further extended in renewing operations at the glass and hinge factory, and in bringing other works to this place. We have the assurance of the other manufacturers here, both by their expressed and published statements, that they do not intend to employ Chinese labor, and we feel convinced that the employment of coolies by the cutlery company was a necessity, not a choice.

We now protest against further agitation of the subject, as the result of any further opposition cannot be otherwise than injurious to the best interests of Beaver Falls.

[Signed by 177 property holders and citizens of Beaver Falls, including the leading manufacturers, merchants, clergymen, physicians, mechanics, tradesmen, and other business men of the place.]

Scientific Lectures at the Stevens Institute.—The course of popular scientific lectures at the Stevens Institute of Technology, which begins on the evening of the 15th instant, will be found of unusual interest. The following are the lectures announced: April 25, "Sunlight and Its Source," by Prof. Henry Morton; April 29, "Moonlight and Its Source," by Prof. Henry Morton; April 29, "The Dead Rivers of the Sierra Nevada, and Hydraulic Gold Mining," by Prof. Benj. Silliman; May 6, "Dyeing and Calico Printing," by Prof. Chas. F. Chandler; May 13, "Fluorescent Light," by Prof. Henry Morton. These lectures will all be found of popular as well as scientific interest, and as course tickets are sold at the very moderate price of one dollar, we hope they will be well attended.

Iron Statistics.—By reference to our advertising columns on this page, our readers will gain some idea of the scope and thoroughness of the Statistical Report of the National Association of Iron Manufacturers, to which we have before called attention in these columns. The table of contents shows what subjects are treated of in the report, and we can assure those interested in the statistics of iron manufacture that it will be found of present interest and permanent value as a work of reference.

A letter from Essen says there will be sent to the Vienna Exhibition from the cannon foundry of Herr Krupp two specimens of his "big guns," that surpass anything of the kind the es-

tablishment has hitherto produced. The first is a gigantic brass cannon, the tube of which will be 6-70 metres in length, and 1-46 metres in diameter, and which will weigh 700 quintals, or 38,000 kilogrammes. The second is manufactured of one block of brass 4 metres long and 1-50 metres in diameter, of the weight of 1000 quintals, or 50,000 kilogrammes. These two model guns are to be dispatched to Vienna toward the middle of the month by special train, via Giessen, Nuremberg and Pönnau.

Special Notices.

THE FOURTH CINCINNATI

INDUSTRIAL EXPOSITION

—WILL OPEN—

Wednesday, September 3,

and continue until

Saturday, October 4, 1873.

Largest and most complete Exhibition ever held in the United States.

Send for Rules and Premium List.

Wanted

A man accustomed to running a Rolling Mill Shears. Apply at 92 Maugin Street, N. Y.

Wanted

By a person of large experience, and well known to the Jobbing Trade of the country, a position of responsibility, either in the management of a department in a large house, or as agent for a manufacturer. Address T. M., office of *The Iron Age*, 10 Warren Street, N. Y.

Wanted,

By a young man, who has had five years' experience in the Retail Hardware Trade, a permanent situation as traveling salesman for a Manufacturing or Jobbing Hardware House. First-class reference given. Address Box 977, Marshalltown, Marshall Co., Iowa.

Wanted,

A Partner, with \$5000 to \$15,000, to take charge of a Hardware Manufacturing Establishment. Door Locks a specialty. Must be competent and practical. Address G. H. EELLS, Marietta, Ohio.

To Steel Manufacturers

WANTED.—A Situation by a practical Sheet Steel Roller. Well experienced in saw and shovel steel. Address CHARLES BELL, 209 Race St., Philadelphia, Pa.

To Manufacturers.—The Board of Trade of Monongahela City, Pa., on the Monongahela River, invites correspondence and visits from Capitalists seeking a favorable manufacturing site. Railroad and River transportation; Cool abundant and cheap. Address D. C. SHAW, Secretary Board of Trade, Monongahela City, Pa.

C. HAMMOND & SON,

MANUFACTURERS OF

Hammers, Edge Tools, RAILROAD, Machinists' & Blacksmiths' Tools.

Office & Sample Rooms, 13 N. 5th St. PHILADELPHIA, April 1st, 1873.

"MONTHLY CIRCULAR."

During the present month our discount will be 15 per cent. net cash, payable on 1st of May next. Orders only accepted to the amount of our monthly product. No guarantee against rise or fall. For illustrated Catalogue enclose 15 cts. in stamps.

R. T. HAZELL, AUCTIONEER.

By R. T. Hazell & Co., Store No. 118 Chambers Street.

OUR REGULAR SALES OF HARDWARE, CUTLERY, FANCY GOODS, &c., will be held on TUESDAYS and FRIDAYS throughout the season. CASH ADVANCES made on CONSIGNMENTS without additional charge.

Trade Register OF HARDWARE And Kindred Interests. 1873.

GUARANTEED CIRCULATION, Five Thousand Copies.

Amongst all good standing Hardware Dealers throughout the United States, payment for advertisements being required only upon proof of fulfillment of our Contract. Will be published about February.

All Parties having anything kindred to Hardware should advertise in it. Circulars upon application.

The Merchants & Man'rs Agency 4 Warren St., N. Y., Publishers.

CAUTION.

The public are warned against paying money in advance for the insertion of advertisements, or other matter in works published by us.

The Merchants and Manufacturers Agency, 4 Warren Street, N. Y.

Special Notices.

Translations for the Vienna Exhibition.

The undersigned begs to be recommended to manufacturers for Translations for the Vienna Exhibition into German, French and Spanish.

C. KIRCHHOFF,

Box 286, Commercial Editor "El Cronista," N. Y.

Wanted.

By a Boston Hardware House, occupying a leading position as manufacturers of, and dealers in, Builders' Hardware, a first-class man, to solicit trade among Builders and Architects in and about Boston, and throughout New England. Must be a person having some mechanical ideas, of good taste and good personal address, and to such a person permanent employment and liberal pay are offered. All communications strictly confidential, and must have full name and address of applicants. Address Box 1079, P. O., Boston.

STATISTICAL REPORT

OF THE

National Association of Iron Manufacturers for 1872.

In response to numerous inquiries from the trade, the above report is offered for sale.

It comprises a royal octavo volume of 287 pages, bound in cloth (price \$2.50, postage free), and contains a very full report of the iron production and consumption throughout the world for the year 1872.

CONTENTS.

Review of Trade for 1872.
Progress of the Industry, 1872.
Production of Pig and Wrought Iron for 1872.
Imports of Foreign Iron.
Iron Shipbuilding.
Labor in the Iron Trade.
Review of the Growth of the Iron Trade in the United States, from 1733 to 1872.
Condition of the Iron Industry Abroad.
Continental Iron Trade.
One Production for 1872.
Bessemer Steel Production for 1872.
Metallurgical Technology, New Processes, &c.
Consumption.
Railway Construction in 1872.
The Iron Press.
Statistical Tables, including:
Production of Anthracite Pig Iron in the United States, from 1851 to 1873.
Production of Charcoal Pig Iron in the United States, from 1851 to 1873.
Production of Bituminous and Coke Pig Iron in the United States, from 1851 to 1873.
Production of Anthracite Pig Iron by States—1851 to 1873.
Production of Charcoal Pig Iron by States—1851 to 1873.
Production of Raw Bituminous Coal and Coke Iron by States—1851 to 1873.
Production of Pig Iron of all kinds in United States—1851 to 1873.
Production of Railroad Iron in the United States—1849 to 1873.
Production of Railroad Iron by States.
Importation of Railroad Iron into the United States—1860 to 1873.
Consumption of Railroad Iron in the United States—1849 to 1873.
Monthly Exportation of Railroad Iron to the United States from Great Britain—1869-'70-'71-'72.
Product of Rolling Mills in the United States—1854 to 1873.
Analysis of Product of Rolling Mills in the United States in 1866.
Pig Iron Exported from Great Britain to the United States—1850 to 1873.
Product of Forges and Bloomeries in the United States—1865 to 1873.
Quantity of Iron of all kinds exported from Great Britain to the United States—1850 to 1873.
Exportation of R. R. Iron from Great Britain to all countries—1860 to 1873.
Production of Pig Iron in England, Scotland and Wales—1860 to 1873.
Production of Pig Iron in France—1818 to 1872.
Production of Pig Iron in Prussia—1860 to 1866.
Official Return of Pig and Wrought Iron Manufactured in Pennsylvania during 1871.
Prices of Pig Iron for the first week in each month of 1872 in New York, Boston, Philadelphia, Pittsburgh, Cincinnati, Cleveland, Louisville, etc.
Prices of Wrought Iron for first week in each month of 1872 in Boston, New York, Philadelphia, Pittsburgh, Chicago and St. Louis.
Statistics of Production and Manufacture from Advance Sheets Ninth Census, 1870, compared with Census Tables of 1860 and 1850.
The whole forming a volume extremely valuable for reference, to every one in the Iron Trade. Copies will be mailed, post free, on receipt of price, by

THOS. DUNLAP,

Sec'y National Ass'n Iron Mfrs.,

341 Walnut street, Phila.

For Sale, &c.

For Sale, Hardware Business.

A well established retail business, in Central Missouri. Stock on hand will amount to about \$6000; well assorted and in perfect order. Terms cash. Address G. W. STEPHENS, Carrollton, Mo.

FOR SALE.

The Napanoch Blast Furnace, Ulster Co., N. Y. Splendid water power. Charcoal and Anthracite Coal in abundance, cheap. Apply to H. Bange, 31 Tompkins Place, Brooklyn, N. Y.

For Sale,

An established Manufactory of Staple Hardware, situated within sixty miles of New York. The Factory is supplied with the best of Machinery, and a well appointed Gray Iron Foundry; and a large amount of local trade can be taken. For further particulars, address

THEO. A. KEELER,

Bridgeport, Conn.

For Sale,

In a large, growing place, within 40 miles of New York, an old established and very profitable Hardware, Stove, Tin and House Furnishing Goods Store. Stock about \$12,000. No risk to purchaser. Business cash. Terms easy. Perfectly satisfactory reasons for selling.

Address A., office of *The Iron Age*, 10 Warren St., N. Y.

For Sale, &c.

Saint Louis Wire Mill For Sale.

The Saint Louis Wire Mill, in complete running order, and having an excellent trade established, will be sold, on reasonable terms, to close co-partnership; or a half interest in the same can be purchased by a responsible party of good business qualifications. This is a splendid opportunity for a safe and profitable investment to any one wishing to engage in the manufacture of wire. For terms, etc., apply to or address

LUDLOW & WILCOX,

St. Louis Wire Mill, St. Louis, Mo.

Charcoal Pig Iron Furnace Property at Franconia, N. H., FOR SALE.

This must be, considering the proximity of Wood and the known character of the Ore, the most valuable Charcoal Furnace Property that can ever come into market. It consists of the celebrated Franconia Iron Ore Bed and ore reservations is about 3500 acres in outlying lots, beside about 3000 acres of valuable wild land. Charcoal Blast Furnace in perfect order. Shops, Dwelling Houses, Store, &c., &c.

It is offered for sale because the owners do not want the care of running it, and are reluctant to have it lie idle with the present and prospective demand for its product. It will be sold at a price and on terms that will give the buyer an opportunity not often to be met with.

The attention of users of Charcoal Iron who wish to establish their source of supply is directed to this property. Address WM. E. COFFIN & CO., Boston, Mass.

For Sale or To Let.

The Stove Foundry lately occupied by Munsell & Thompson, situated at Elizabethport, N. J., can be adapted to any manufacturing purpose, having coal and iron within one block, direct from the mines. Communication with New York 32 times a day by rail, and 4 times by steamboat. Within half a block of the river. Will be let for one or more terms of years. Apply to or address

A. BAIZ & CO.,

32 Broadway, N. Y.

Rolling Mills For Sale or Lease.

The "CALVERT ROLLING MILLS," situated in the city of Baltimore, were withdrawn from the sale advertised on the 16th of May, and are now offered at private sale, or will be leased to responsible parties. The terms will be made advantageous. The Mills are in perfect order, and can be put in operation at short notice.

For full information address

ALEX. BROWN & SONS, BALTIMORE.

Rolling Mill Machinery For Sale

One train, 3 high, finishing rolls, with steam engine 75 H. P.; and balance wheel, 20,000 lbs.—complete and in good order—by

Fearing, Rodman & Swift,

23 & 25 Commercial Street, Boston.

Boston, Nov., 30, 1872.

For Sale,

The Machinery and Tools of the Keeseville Wire Company.

Parties desiring to buy will find this a good opportunity. For particulars apply to

The Keeseville Wire Co.,

Keeseville, N. Y.



WHITNEY MFG. CO.

162 and 164 West 27th St., NEW YORK.

Manufacturers of

REAL BRONZE Door Knobs, ORNAMENTAL BRONZE FRONT MORTISE LOCKS

Sash Fasteners, Bell Pulls, Shutter Knobs,

FAST AND LOOSE JOINT ORNAMENTAL BUTTS.

Catalogues sent on application.

Hart, Bliven & Mead Mfg. Co.,

General Agents for New York.

HOWSONS'

OFFICES FOR PROCURING

UNITED STATES AND FOREIGN PATENTS, Forrest Buildings

119 SOUTH FOURTH ST., PHILADELPHIA, AND MARBLE BUILDINGS

605 Seventh St. (Opposite U. S. Patent Office, Washington, D. C.)

J. HOWSON, Solicitor of Patents; C. HOWSON, Attorney Law.

Communications should be addressed to the PRINCIPAL OFFICES PHILADELPHIA.

JAMES A. WHITNEY, Patent Agent and Expert, offers his services to inventors in securing American and Foreign Patents, as expert in patent cases, etc.

"We take pleasure in commending the new agency to the favor of inventors." *The Iron Age*, June 6.

"Of Prof. James A. Whitney we can speak from a personal acquaintance. Any person seeking professional advice from him will be certain of just and honorable treatment." *Norwich, Conn., Daily Advertiser*, May 29.

"His long experience in this field of investigation has made him familiar with the business in all its branches, and we can confidently recommend him to those needing his services." *Frederic Farmer, Chicago*, June 1.

"Few persons have had more opportunities for learning the necessities of such a business." *The Worcester* (weekly), New York City, June 19.

"A thorough mechanical engineer with a valuable practical experience in the machine shop." *Am. Revue*, Boston, June 5.

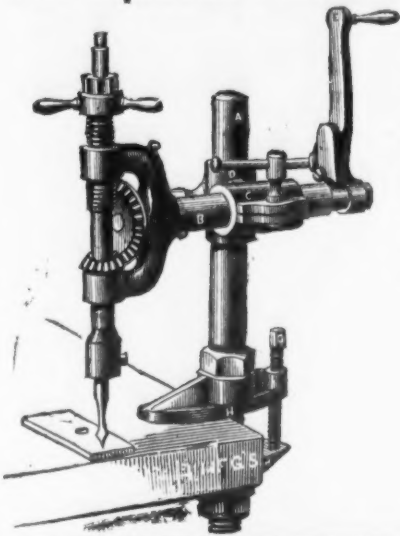
"Mr. Whitney is qualified by experience and practical knowledge. His life and experience have been such as to develop the fullest sympathy with men engaged in industrial pursuits, especially inventors." *New York Herald*, June 4.

Address, for full information, free of charge, 125 Broadway, Room 11, New York City.

Rolled zinc is realizing £32 to £32. 2/6.

The Improved Patent Universal Angular and Ratchet Drilling Machine,

Adjustable to any angle, and easily carried to any part of the shop for making Repairs.



Over 4000 of these machines are now in use, and the demand is steadily increasing. Dealers will find them of ready sale and at satisfactory profits. These machines were formerly sold by Messrs. Holland & Cody, and Duryea & Kelley, but since the Miller's Falls Co. purchased the patent and began to make them exclusively in their own shops, the quality and finish has much improved, and they are now really desirable goods. These Drilling Machines are for sale in most of the larger cities at our regular prices, but where they are not so kept we will supply them on demand.

No. 1, weight	26 lb.,	Drill	1/2 in. hole	Price, \$34.00
No. 2, "	52 lb.,	"	"	" 38.00
No. 3, "	106 lb.,	"	1 1/2 "	" 65.00

With usual trade discount.

MILLERS FALLS CO.,

78 Beekman Street, New York.

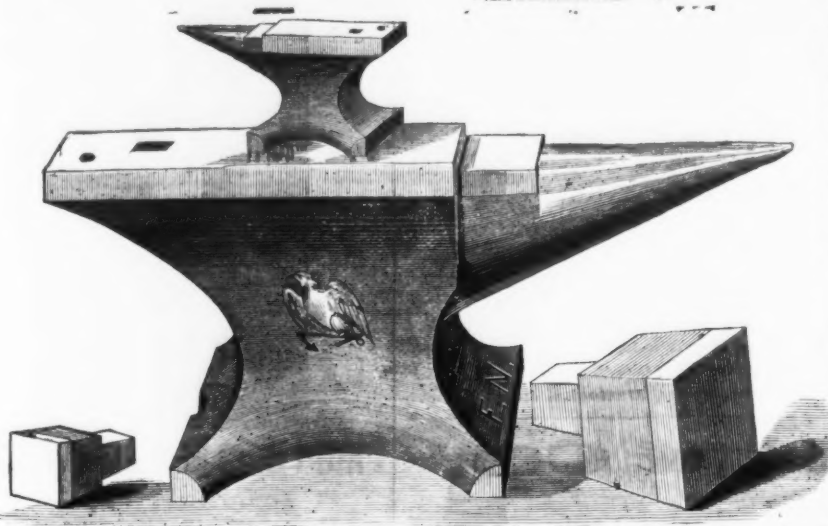
Factory at Millers Falls, Mass.

ALSO MANUFACTURE

Barber's Bit Braces and Parallel Vises.

The Fisher & Norris Eagle Anvil Works.

(ESTABLISHED 1843.)



FISHER & NORRIS manufacture to special order Anvils for Saw Makers, File Makers, Axe Makers, &c; also, Copper Smiths', Silver Smiths' and Tinmans' Stakes and Blocks, with hardened and polished cast steel faces; also, the well known Parallel Chain Vises.

PRICE LIST.

ANVILS weighing 100 lbs. to 600 lbs., 11 cts. per lb.

Smaller Anvils, ("Minims.")	1	2	3	4	5	6	7	8	9
No. 0	15 lb.	30 lb.	30 lb.	40 lb.	50 lb.	60 lb.	70 lb.	80 lb.	90 lb.
Weighing about 10 lb.	Price, \$3.50	\$4.25	\$5.00	\$5.50	\$6.50	\$7.50	\$8.00	\$10.00	\$10.50

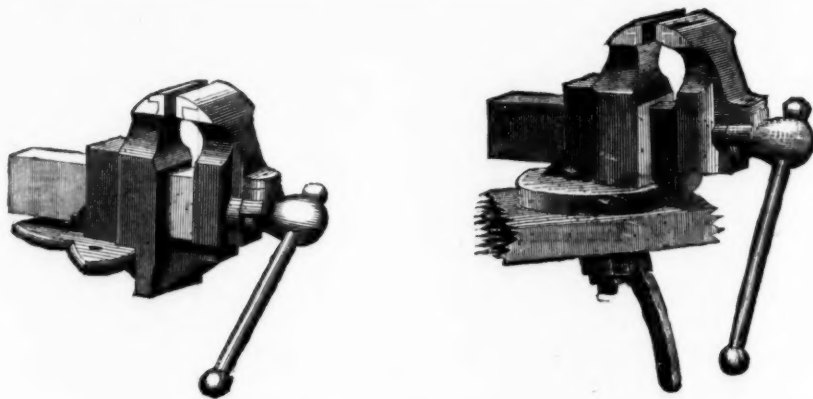
SOLD BY OUR AGENTS, (with usual discounts to the trade).

New York.—Messrs. CLARK, WILSON & CO.—RUSSELL & ERWIN MANUFACTURING COMPANY.—DURRIE & RUSHER.
Boston.—GEORGE H. GRAY & DANFORTH. Philadelphia.—JAMES C. HAND & CO. Baltimore.—W. H. COLE.

FISHER & NORRIS Trenton N. J.

HOWARD

PARALLEL BENCH VISE.



Manufactured at the

HOWARD IRON WORKS,

Buffalo, N. Y.

RUSSELL & ERWIN MANUFACTURING CO.,

New York and Philadelphia, Agents.

WILSON MANUFACTURING COMPANY.,

NEW LONDON, CONN.

MANUFACTURERS OF

SOLID BOX VISES.

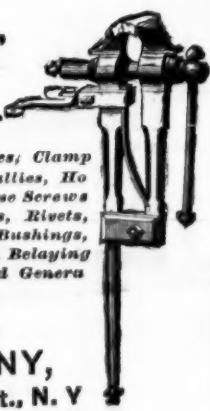
With or without Convex and Concave Washers.

Jack-screws, Braces, Coffee Mills, Turning Lathes, Clamp Heads and Screws; Parallel Bench Vises, Sash Pullies, Ho House Pullies, Composition Cocks, Bench Screws, Vice Screws, Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and General Hardware.

GALVANIZING DONE TO ORDER.

WILSON MFG. COMPANY,

Warehouse 37 Chambers St., N. Y.



SCHOLEFIELD, GOODMAN & SON,

(Formerly JOSHUA SCHOLEFIELD & SONS.)

GENERAL

Hardware Merchants,

BIRMINGHAM, - ENGLAND.

Agents and Sample Rooms.

New York—Edward Frith, 16 CHURCH STREET.

Boston—H. L. Richards, 18 BATTERYMARCH STREET.

New Orleans—R. Rhodes, 71 CAMP STREET.

Montreal—J. J. Evans 14 ST. JOHN STREET.

Established 1847.

CASH PAPER WAREHOUSE

No. 44 Beekman St., N. Y. Every description of Hardware, Manila and Wrapping PAPERS,

Suited to the Hardware Trade and Merchants generally, or made to order.

MELVIN RAND & SON, 44 BECKMAN ST.

The Hubbard & Curtiss Mfg. Co.,

MANUFACTURERS OF

Box Wood and Ivory Rules, Framing and Firmer Chisels, Drawing Knives, &c.

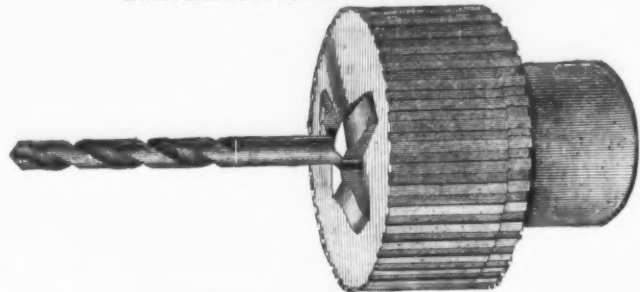
No. 82 Chambers Street, New York, MANUFACTORY, MIDDLETOWN, CONN.

DEPOT FOR

Middletown Tool Co.,
John Charlton,
Sanseer Manufacturing Co.,
Andrews Bros.,
Warwick Tool Co.

Etna Nut Co.,
Brendlinger & Co.,
Porter Saw Co.,
Lewis Armstrong & Colwell,
Campbell & Co.

UNIVERSAL SELF-TIGHTENING



DRILL CHUCK.

(Superior to all others, and the only practical Chuck.)

All the motions in this Chuck are positive. It has no spring or complicated mechanism to break or get out of order. The Large Chuck is on the same principle, precisely, and has an arrangement of the jaws for chucking small articles, for turning, boring, &c. The Small Chuck holds drills from 1/8 shank down. The Large, from 1/2 down to 1 1/2. Price—Small, \$6.00. Large, \$8.00.

The Taylor Manufacturing Company, New Britain Conn.
Hardware Manufacturers. Send for Catalogue.

Established 1836.

SIDNEY SHEPARD & CO.,



MANUFACTURERS OF

FRENCH STAMPED AND JAPANNED TIN WARE.

Also, a Large Variety of Useful Articles.

DEALERS IN

Hardware and Metals,
Tinmen's Tools, Machines and Trimmings.

Please send for Illustrated Catalogue and Price List.

SIDNEY SHEPARD & CO., Buffalo, N. Y.

ALFRED FIELD & CO.,

Foreign Hardware
Commission Merchants.

PRINCIPAL OFFICES,

Birmingham, England, Nos. 66 & 67 Parade.

Sheffield, England, No. 23 Westfield Terrace.

New York, U. S., Nos. 47 John and 5 Dutch St.

BRANCH OFFICES,

Philadelphia, Cincinnati, New Orleans and

Montreal.

Shipping Office,

Middleton Building, No. 1 Rensford St.,

Liverpool.

VAN WART, SON & CO.

Hardware Commission Merchants,
BIRMINGHAM, - ENGLAND.

AGENTS

VAN WART & McCOY,

43 Chambers Street, New York.

GEORGE H. GRAY & DANFORTH,

48 India Street, Boston.

F. W. TILTON,

17 Old Levee Street, New Orleans.

At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for the

John Rimmer & Son's Celebrated

Harness and other Needles.

OSCAR IRVING VAN WART & SON

FORWARDING AGENTS,
South John Street, LIVERPOOL.

Hardware.

ROY & COMPANY,

West Troy, N. Y.,

Manufacturers of

Wrought Iron Butts, Strap and T Hinges,
PLATE AND HOOK HINGES,
Cold Pressed Nuts and Washers, Felloe Clips, &c.
JOHN L. FISHER, Agent, 98 Chambers Street, New York.

SPEAR & JACKSON,

Sheffield, England,

MANUFACTURERS OF

Saws, Files, Edge Tools and Steel.

JOHN L. FISHER, Agent.

98 Chambers Street NEW YORK.

F. WIEBUSCH,

IMPORTER OF

German, Sheffield and Birmingham
HARDWARE AND CUTLERY, CHAINS AND ANVILS.

No. 84 Chambers Street, N. Y. Office at Sheffield, No. 1 Arundel Lane,

Agent for WM. WILKINSON & SONS, Sheep Shears and Hedge Shears.
do THEILE & QUACK, German Hardware and Cutlery.
do GEO. FISHER & CO., Files.
do HENRY WALDRON, English Grain and Grass Scythes.
do J. D. THEILE, Chains.
Headquarters for PETER WRIGHT'S Anvils and Vises.
do JOHN WILSON'S Butcher Knives.
do W. & S. BUTCHER'S Files, Edge Tools and Razors.
Also, Manufacturers of "MONUMENTAL" and "TYLER" Pocket Cutlery.

HILGER & SONS,

87 Chambers and 69 Reade Streets, NEW YORK.

MANUFACTURERS AND IMPORTERS OF

German Hardware, Cutlery, Scissors, Coffin Lace, Sheep Shears,
Ball Braces, Bright Halter and Coil Chains, &c.

Also, Birmingham and Sheffield Hardware and Chains, Butcher's Files, Edge
Tools & Razors, Wostenholm's Razors & Farriers' Knives, John Wilson's Butcher
Knives and Steels, Stub's Tapers, Chesterman's Metallic Tapes, Isaac Greave's
Hedge Shears, James Bees & Parkin's Spoke Shaves, Turn Screws and Braces,
Pad Locks, Goulcher's Gun Locks, Brades Trowels, &c.

HERMANN BOKER & CO.,

OFFICES AND WAREHOUSES:

NEW YORK, 101 and 103 Duane and 91 and 93 Thomas Streets.

REMSCHIED and SOLINGEN (Prussia.)

SHEFFIELD (England), No. 3 Arundel Lane, Represented by Mr. ARTHUR LEE.

LIEGE (Belgium), Represented by Mr. LOUIS MULLER.

Manufacturers and Importers of Cutlery, Guns, Hardware and Railroad Material.

Proprietors of TRENTON-VISE AND TOOL WORKS, Trenton, N. J.—Vises, Picks,
Mattocks, Grub Hoes, Sledges, Hammers, &c.Sole Agents for LAMSON & GOODNOW MFG. CO., Shelburne Falls, Mass.—Table Cut-
lery and Butcher Knives.

We always have on hand a full assortment of

German and English Hardware, Cutlery, Guns, Gun Material,
Chains, Heavy Goods.

W. & S. Butcher's Files, Edge Tools and Razors, the largest stock in the United States.

John Wilson's Butcher and Shoe Knives.

Peter Wright's Anvils. Also,

Spiegel Iron and Puddled Steel Scrap for Cast Steel Manufacture.

STANLEY WORKS,

MANUFACTURERS OF

Wrought Butts, Strap and T Hinges.

Bronzed Butts and Bolts.

Wrought Barrel, Square and Shutter Bolts.

Wrought Chest Handles, Washers, Flush Bolts, &c.

79 CHAMBERS ST., NEW YORK.

Factory at New Britain, CONNECTICUT.

BEAM & MURRAY,

IMPORTERS OF

Anvils, Chains, Pocket Cutlery,
Guns, Files,

BIRMINGHAM, SHEFFIELD & GERMAN HARDWARE,

Wostenholm's IXL Pocket Knives & Razors, Butcher's Files, Tools, &c.

No. 54 Cliff Street, NEW YORK.

Hardware.

BUFFALO IRON AND NAIL WORKS.
PRATT & CO.
BUFFALO, N. Y.
MANUFACTURERS OF
BAR IRON, ANGLE IRON, PLATE IRON, SHAPE IRON, FORGED IRON
Railroad Fish Plates, Bolts & Spikes.
CUT NAILS, COLD CUTNUTS, CUT WASHERS, COACH SCREWS, HORSE NAILS
Bridge, Roof, Pier & Ship Iron Work
BOILER RIVETS, DRAG TEETH, BOLT ENDS, BOLT BLANKS, CROWBARS
WHOLESALE & RETAIL DEALERS IN
HARDWARE.
STORES & OFFICES TERRACE SQUARE BUFFALO, N. Y.

GEORGE B. WALBRIDGE,

55 CHAMBERS STREET, NEW YORK,

Represents:

PRATT & CO.,

Buffalo Iron and Nail Works,

NATIONAL HORSE NAIL CO.,

Finished, Polished and Pointed Horse Nails.

WOOLWORTH HANDLE WORKS,

Axe, Pick and Sledge Handles, &c.

SHELTON CO.,

Tacks, Bed Screws, Carriage, Tire & Stove Bolts, &c.

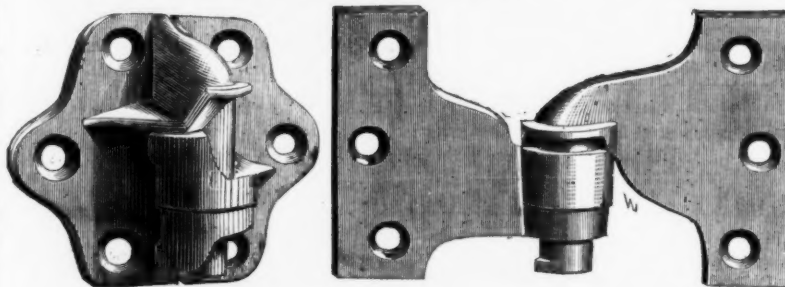
D. H. GOODELL,

Lightning & Turn-Table Apple Parers, & Cherry Stoners.

WOODS CUTLERY CO.,

Hot Water Proof Table Cutlery.

Elephant Axes and Tools, Hatchets, Picks, Mattocks, &c.

CLARK & CO.

Surface.

Patented Nov. 3, 1865.

Mortise.

THE STRONGEST BLIND HINGES IN MARKET.

Upper and Lower Hinges are alike, locking the top and bottom of the Blinds.
On long Blinds three or more may be used without mismatching sets,
and all will fasten. They cannot be broken or closed by the wind.
We would call the attention of the trade to our Improved Reversible Self-Closing Gate
Hinges. Also our Improved Axle Pulleys, both Iron and Boxwood Wheel, Sash
Locks, Sash Bolts, &c.

CLARK & CO., Buffalo, N. Y.

Send for Illustrated Catalogue and Price List

YALE LOCK MFG. CO.Office and Works
at
STAMFORD,
Conn.Salesroom
No. 1 Barclay
New York.**FINE FLAT-KEYED LOCKS** for all Purposes

RIM and MORTISE STORE DOOR LOCKS,
Heavy Front Door and Vestibule Locks.

Rim and Mortise Night Latches,

CLOSET, CHEST, DRAWER, DESK and PADLOCKS,

Post Office Lock Boxes and Prison Locks,

Leeds' Gate Fixtures, Field's Shutter Bars, etc., etc.

The Yale Lock Manufacturing Co.,
STAMFORD, CONN.

The Best
TUMBLER
LOCK
Ever Made.



Samples sent
on
Application

New Pattern Key.
No. 500 Yale Lock.

NORWICH LOCK MFG. CO.

Salesrooms:

Norwich, Conn.
Adams & Chute,
4 Liberty Sqr., Boston.

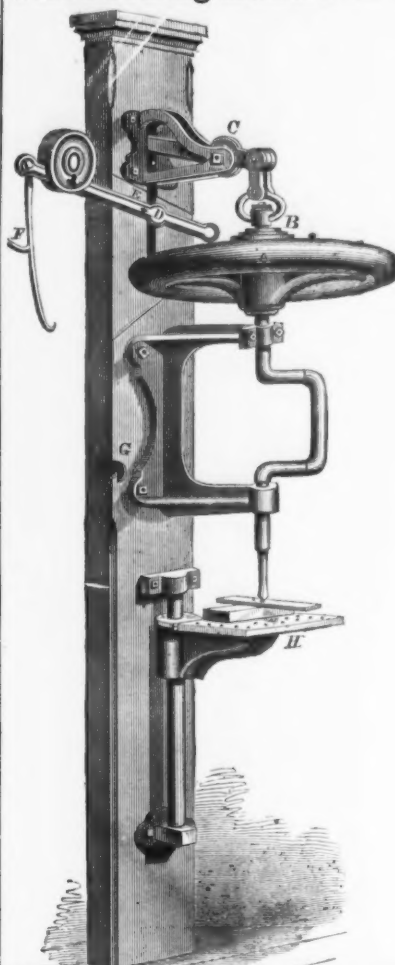
88 Chambers St., N. Y.
John C. Brenner, Son & Co.,
21 North 5th St., Phila.



BUCK BROTHERS, Millbury, Mass.
LARGEST STOCK AND BEST ASSORTMENT IN THE UNITED STATES OF
SHANK AND SOCKET FIRMER CHISELS.
Also, BEST QUALITY SOCKET FRAMING CHISELS.

Hardware.

BIDDLE MANU'FG CO.
PATENT
Self Feeding Hand Drill.



Fine Tools & Hardware
Specialties.

Warerooms,
78 Chambers Street, N. Y.
Send for catalogue.

The Peck Stow & Wilcox Company

MAKE

Tinnery Tools and Machines,

COFFEE MILLS,

CARRIAGE BOLTS,

Steelyards, Dividers, Compasses,

Coes Wrenches,

WROUGHT and MALLEABLE.**STEEL and IRON SQUARES.**

And a large variety of

General Hardware.

Send for a Catalogue. 97 Chambers St., N. Y.

**Blacksmiths' Hand Drill.**

Manufactured by **MORRELL & TIEBOUT,**
Cor. of Grand & First Sts., Williamsburg, N. Y.
Send for Circular and Price List.

New York Wholesale Prices, April 9, 1873.

HARDWARE

[illegible]

Jack Chain, Iron	dis 35 @ 40
" " Brass	dis 20 @ 35
Chalk.	
White	gross, 50
Red	gross, 75
Crayon	gross, 14
Curry Stoners.	
" Fantasy	gross \$9 00
Chisels.	
Socket Firmers	dis 60 & 85 @ 60 & 10
Socket Framing	dis 60 & 10
Socket Corner	dis 60 & 10
Square Firmers	dis 40 @ 40 & 10
Batcher's " "	\$5 50 to gold—new list
Spear & Jackson's	\$5 50 to gold—new list
Clips, Axle.	
Norway or Best	dis 20 @ 30
Superior	dis 40 & 5
" " Superior, Philadelphia	dis 45 & 5
Coal Shovels,	
Iron Hand	per doz, \$ 85 @ 1 25
Wooden handled	per doz, 1 00 @ 2 00
Coal Hods.	
Smith, Burns & Co.	dis 25
No. 14 15 16 17 18	
Janvald, \$2 00 9 75 10 50 12 00 13 50 per doz	
Ganzelard, 13 50 14 50 15 50 17 50 19 50	
Cocks.	
Brass Ratchet	dis 10 & 10
Lock & Globe	dis 10
Brace's	per doz net 5 50 @ 25 00
Common Board and Box	dis 10 & 10
Better Grades	dis 10
Increase Wilson's	new list
French Steel	dis 10 @ 20
Swiss	dis 30
Swift's	dis 30
Compasses and Dividers.	
Bemis	dis 15 & 15 @ 20 & 5 & 15
Excelsior	dis 30
Ritchie, Smith & Wilson	dis 30
Coopers' Tools.	
Bradley's	dis 15 @ 20
Ehas. E. Little	dis 15 @ 20
Corn Knives and Cutters.	
list net	
Crucibles.	
Gautier & Co.	per No. 5 5c
Curry Combs.	
Hutchings' and Kellogg's, Iron and Brass	dis 10
" " Rubber	dis 10
Kutgers	dis 15 @ 30
Rubber	per doz, \$9 00—dis 10
Curtain Pins.	
Steeled Glass	dis 40 & 10
Cutters.	
American Table	dis 15
American Pocket	dis 15
Door Springs.	
Palmes Patent	\$7 50 per doz—dis 30 & 10
Falmer	per doz \$5 50
Drawing Knives.	
Bradley's	dis 60 @ 60 & 10
Morse's	dis 25
Morse's Ratchet	dis 25
Moore's Triple Acting Ratchet	dis 20
Egg Beaters.	
Jordan's	per doz net \$8 25 @ 8 50
Charles' Patent	per doz net 2 25 @ 3 00
Wright's Aerating	dis 10
Over	per doz net \$6 00
Emery.	
Castine Chester—Regular Nos.	per lb 8c
" " Flour and FF	per lb 5c
Castine Mills—Regular Nos.	per lb 8c
" " Flour	per lb 5c
Enameled and Tinned Ware.	
Paris, Glue Pots, &c.	dis 10
Faucets	dis 5
Lark Lined, Wood	dis 55 & 10
Cent's	dis 50
Cork Stops	dis 55 & 10
Cory's Patent Petroleum	dis 10 & 10
Patent Petroleum	dis 20 & 10
" " Metallic	dis 40
Files.	
American Best	\$5 00 to £ net
Johnson—Mill	5 00 to £ net
" " Others	5 00 to £ net
Tappin (single cut)	5 00 to £ net
Riley Carr's	5 00 to £ net
ubs	8 00 @ 8 25 to £ gold
etler's	5 50 to £ gold
Jack's Jack's	5 50 to £ gold
Greaves, Smith & Co.'s	4 75 to £ gold
Vester's	5 00 to £ net
K. & C. Peace's "Imperial"	3 25 to £ gold
and Murray	5 00 to £ gold
ther's "Cyclops	4 85 to £ gold
odlad's	4 00 to £ gold
son's & Gamble	5 25 @ 5 50 to £ gold
Finishing Machines.	
me	\$7 00 each net
each net	5 75 each net
vill, No. 2	7 00 each net
ox, with 4-inch Rolls	5 00 each net
K	6 00 each net
celor, No. 1	4 75 each net
" 2	6 50 each net
mond	7 50 each net
max, 7-inch Rolls	6 50 each net
" 4 1/2"	6 50 each net
pire	4 00 each net
ska, No. 1, 7-inch Roll	8 00 each net
ch, 7-inch Roll	6 00 each net
F. M. K., 4 1/2 inch Roll	6 00 each net
" 6 inch Roll	6 00 each net
penter's Self-Heating	13 50 each net
rly, 5-inch Roll	10 00 each net
er's Fashion Flutter, 4 1/2 inch Rolls	3 00 each net
Press Pans.	
med—	\$3 00 3 25 3 50 4 00 4 50 5 00 5 50 6 00 7 00
oz.—	1 2 3 4 5 6 7 8
K, Stow & Wilcox	6 50
th, Burns & Co., "Excelsior" Polished,	dis 30
ox, 7 40 4 00 4 50 5 00 6 00 7 00 8 00 per doz,	
oz.	3 4 5 6 7 8
Hammers.	
dole's	new list
ney's	new list
ney's	dis 5
net Hammer Co.	dis 5 @ 10
ot & Co.	dis 15
Handies.	
Hammer Hatchet	dis 10
kertown, Axe, Pick and Sledge	dis 10
" " Hammer and Hatchet	dis 10
aboro, "Axe, Pick, Hammer, &c.	dis 10
Harness Snaps.	
dis 30	
dis 10	
Hatches.	
h Blood	dis 10
ingling, Nos. 123.	per doz \$7 50 8 00 8 50
ingling, " 123.	per doz 7 50 8 00 8 50
ingling, " 123.	per doz 7 50 8 00 8 50
ingling, Nos. 123.	per doz \$7 25 8 00 8 50
ingling, " 123.	per doz 7 25 8 00 8 50
ingling, " 123.	per doz 7 25 8 00 8 50
ingling, Nos. 123.	per doz \$8 00 8 50 9 00
ingling, " 123.	per doz 8 00 9 00 9 50 10 00
ingling, " 123.	per doz 8 00 8 50 9 00
ark Edge Tool Co.	per doz \$6 50 7 00 7 50
ingling, Nos. 123.	per doz \$6 50 7 00 7 50
ingling, " 123.	per doz 6 50 7 00 7 50
ingling, " 123.	per doz 6 50 7 00 7 50
ingling, Nos. 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, Nos. 0 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00
ingling, " 123.	per doz 7 00 7 50 8 00

[illegible][illegible]

3 1/2 in. x 1/2 in. and 1/2 in. square.	per ton	160 00
3 1/2 in. x 3/4 in. and 3/4 in. square.	"	155 00
4 in. x 1/2 in. and 1/2 in. square.	"	150 00
4 in. x 3/4 in. and 3/4 in. square.	"	160 00
2 in. round and square.	"	107 50
1 1/2 in. x 1/2 in. and 1/2 in. thick.	"	107 50
1 1/2 in. x 3/4 in. and 3/4 in. thick.	"	112 50
1 1/2 in. x 1 in. and 1 in. thick.	"	115 00
3 in. round and square.	"	125 00
2 1/2 in. x 1/2 in. and 1/2 in. thick.	"	120 00
2 1/2 in. x 3/4 in. and 3/4 in. thick.	"	127 50
2 1/2 in. x 1 in. and 1 in. thick.	"	114 50
2 1/2 in. x 1 1/2 in. and 1 1/2 in. thick.	"	117 50
2 1/2 in. x 2 in. and 2 in. thick.	"	120 00
2 1/2 in. x 2 1/2 in. and 2 1/2 in. thick.	"	125 00
2 1/2 in. x 3 in. and 3 in. thick.	"	130 00
2 1/2 in. x 3 1/2 in. and 3 1/2 in. thick.	"	135 00
2 1/2 in. x 4 in. and 4 in. thick.	"	150 00
2 in. x 1 in. and 1 in. thick.	"	125 00
1 1/2 in. x 1/2 in. and 1/2 in. thick.	"	127 50
1 1/2 in. x 3/4 in. and 3/4 in. thick.	"	127 50
1 1/2 in. x 1 in. and 1 in. thick.	"	132 50
1 1/2 in. x 1 1/2 in. and 1 1/2 in. thick.	"	137 50
1 1/2 in. x 2 in. and 2 in. thick.	"	142 50
1 1/2 in. x 2 1/2 in. and 2 1/2 in. thick.	"	147 50
1 1/2 in. x 3 in. and 3 in. thick.	"	152 50
1 1/2 in. x 3 1/2 in. and 3 1/2 in. thick.	"	157 50
1 1/2 in. x 4 in. and 4 in. thick.	"	162 50
1 1/2 in. x 4 1/2 in. and 4 1/2 in. thick.	"	167 50
1 1/2 in. x 5 in. and 5 in. thick.	"	172 50
1 1/2 in. x 5 1/2 in. and 5 1/2 in. thick.	"	177 50
1 1/2 in. x 6 in. and 6 in. thick.	"	182 50
1 1/2 in. x 6 1/2 in. and 6 1/2 in. thick.	"	187 50
1 1/2 in. x 7 in. and 7 in. thick.	"	192 50
1 1/2 in. x 7 1/2 in. and 7 1/2 in. thick.	"	197 50
1 1/2 in. x 8 in. and 8 in. thick.	"	202 50
1 1/2 in. x 8 1/2 in. and 8 1/2 in. thick.	"	207 50
1 1/2 in. x 9 in. and 9 in. thick.	"	212 50
1 1/2 in. x 9 1/2 in. and 9 1/2 in. thick.	"	217 50
1 1/2 in. x 10 in. and 10 in. thick.	"	222 50
1 1/2 in. x 10 1/2 in. and 10 1/2 in. thick.	"	227 50
1 1/2 in. x 11 in. and 11 in. thick.	"	232 50
1 1/2 in. x 11 1/2 in. and 11 1/2 in. thick.	"	237 50
1 1/2 in. x 12 in. and 12 in. thick.	"	242 50
1 1/2 in. x 12 1/2 in. and 12 1/2 in. thick.	"	247 50
1 1/2 in. x 13 in. and 13 in. thick.	"	252 50
1 1/2 in. x 13 1/2 in. and 13 1/2 in. thick.	"	257 50
1 1/2 in. x 14 in. and 14 in. thick.	"	262 50
1 1/2 in. x 14 1/2 in. and 14 1/2 in. thick.	"	267 50
1 1/2 in. x 15 in. and 15 in. thick.	"	272 50
1 1/2 in. x 15 1/2 in. and 15 1/2 in. thick.	"	277 50
1 1/2 in. x 16 in. and 16 in. thick.	"	282 50
1 1/2 in. x 16 1/2 in. and 16 1/2 in. thick.	"	287 50
1 1/2 in. x 17 in. and 17 in. thick.	"	292 50
1 1/2 in. x 17 1/2 in. and 17 1/2 in. thick.	"	297 50
1 1/2 in. x 18 in. and 18 in. thick.	"	302 50
1 1/2 in. x 18 1/2 in. and 18 1/2 in. thick.	"	307 50
1 1/2 in. x 19 in. and 19 in. thick.	"	312 50
1 1/2 in. x 19 1/2 in. and 19 1/2 in. thick.	"	317 50
1 1/2 in. x 20 in. and 20 in. thick.	"	322 50
1 1/2 in. x 20 1/2 in. and 20 1/2 in. thick.	"	327 50
1 1/2 in. x 21 in. and 21 in. thick.	"	332 50
1 1/2 in. x 21 1/2 in. and 21 1/2 in. thick.	"	337 50
1 1/2 in. x 22 in. and 22 in. thick.	"	342 50
1 1/2 in. x 22 1/2 in. and 22 1/2 in. thick.	"	347 50
1 1/2 in. x 23 in. and 23 in. thick.	"	352 50
1 1/2 in. x 23 1/2 in. and 23 1/2 in. thick.	"	357 50
1 1/2 in. x 24 in. and 24 in. thick.	"	362 50
1 1/2 in. x 24 1/2 in. and 24 1/2 in. thick.	"	367 50
1 1/2 in. x 25 in. and 25 in. thick.	"	372 50
1 1/2 in. x 25 1/2 in. and 25 1/2 in. thick.	"	377 50
1 1/2 in. x 26 in. and 26 in. thick.	"	382 50
1 1/2 in. x 26 1/2 in. and 26 1/2 in. thick.	"	387 50
1 1/2 in. x 27 in. and 27 in. thick.	"	392 50
1 1/2 in. x 27 1/2 in. and 27 1/2 in. thick.	"	397 50
1 1/2 in. x 28 in. and 28 in. thick.	"	402 50
1 1/2 in. x 28 1/2 in. and 28 1/2 in. thick.	"	407 50
1 1/2 in. x 29 in. and 29 in. thick.	"	412 50
1 1/2 in. x 29 1/2 in. and 29 1/2 in. thick.	"	417 50
1 1/2 in. x 30 in. and 30 in. thick.	"	422 50
1 1/2 in. x 30 1/2 in. and 30 1/2 in. thick.	"	427 50
1 1/2 in. x 31 in. and 31 in. thick.	"	432 50
1 1/2 in. x 31 1/2 in. and 31 1/2 in. thick.	"	4

Copper and Brass Rivets and Burs made to particular sizes and patterns.
The discount on the foregoing list will be 10 per cent.

GERMAN SILVER MARKET METAL AND WIRE.

Wire.	Market Metal.
4 per cent. 12 inch. to No. 36.	0.75
6 " " " " " " " "	0.75
10 " " " " " " " "	0.90
12 " " " " " " " "	1.00
14 " " " " " " " "	1.10
16 " " " " " " " "	1.25
18 " " " " " " " "	1.30
20 " " " " " " " "	1.40

German Silver Sheets over 12 inches wide and weighing more than 10 lbs. \$2.00 per sq. ft. Advance two cents for each additional inch in width above 12 inches, and two cents per pound on each No. thinner than No. 36, inclusive.
All German Silver thinner than No. 36 is Platers' at 50 cents per pound additional.
German Silver Scrap, one-third less than net price of 12 inch Market Metal; German Silver Turnings, Filings and Chips, half the price of scrap.
Brown and Sharp's Gauge is about two numbers finer than Stubbs' Wire Gauge.

COPPER—DUTY: Pig. Bar and Ingot, 5: old copper, 4 cents; 3: Manufactured (including all articles of which copper is a component of chief value), 45¢ ad valorem. A hundred to a reduction of 10 per cent.

American Ingot, 35¢ @ 25¢

English, 30¢ @ 31¢

SMELTING, BRAZING, COPPER, BOLTS, &c.

Braziers Copper, ordinary sizes, over 16 oz., 45¢ per square foot.

Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot, 48¢.

Braziers' Copper, 12 oz. per square foot and lighter, 51¢.

Circles less than 84 inch in diameter, 48¢.

Circles, 84 inch diameter and over, 51¢.

Segment and Pattern Sheets, 48¢.

Locomotive Fire Box Sheets, 45¢.

Sheathing Copper, over 12 oz. per sq. ft., 49¢.

12 oz. per sq. ft. and lighter, 51¢.

Bolt Copper, 45¢.

No Copper is sheathing except 1445 inches, and not to exceed 34 oz. to the square foot.

TINNING.

14x38, by the case, 8¢. 7 sheet.

14x38, less than case, 10¢.

Boiler sizes, 7 and 8 inch, 12¢.

9 inch, 15¢.

Other sizes not larger than 30x60, 2¢. 7 sheet.

Larger than 30x60, 5¢.

Copper Bottoms, 48¢. 7 sheet.

O'NEIL'S PATENT FINISHED COPPER.

14x38.

14 and 16 oz. and heavier, 49¢. By the case, 45¢. 7 sheet.

12 oz. and lighter, 51¢.

7 in., 14x32, 8 in., 14x36, 9 in., 14x60.

14 and 16 oz. and heavier, 51¢. By the case, 50¢. 7 sheet.

(And all sizes not over 20 inches wide).

30x60.

14 and 16 oz. and heavier, 55¢. 7 sheet.

2 oz., 56¢.

LEAD—DUTY: Pig, \$2 per 100 lbs.; old Lead, 13¢ cent per lb.; Pipe and Sheet, 2¢ cent per lb. All subject to a reduction of 10 per cent.

Spanish, 6¢. 5¢ gold

German Redwood, 6¢. 5¢ gold

English, 7¢. 5¢ gold

Bar, 10¢. 5¢ gold

Pipe, 10¢. 5¢ gold

Tin Lined Pipe, 10¢. 5¢ gold

Sheet, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Shot, 10¢. 5¢ gold

Paints, Oils, etc.

Paints.

Black, lamp—Conch Painters, 30¢.

" " Ordinary, 15¢.

" " Ivory Drop, fair, 15¢.

Black Paint, in oil, kegs, 8¢; asst'd cans, 10¢.

Blue, Prussian, fair to best, in oil, 30¢ @ 45¢.

" " Chinese, dry, 25¢.

" " Ultramarine, 25¢ @ 30¢.

Brown, Spanish, 13¢.

" " Van Dyke, 13¢.

Carmine, French, 14¢.

Green, Chrome, 15¢ @ 25¢.

" " in oil, 18¢ @ 25¢.

" " Paris, good, 20¢; best, 40¢.

Mineral Paints, 1¢ to 4¢.

Orange Mineral, 14¢.

Red Lead, American, 9¢.

" " English, 10¢.

" " Venetian (N. C.) dry, 15¢.

" " in oil, asst'd cans, 11¢; kegs, 8¢.

" " Indian, dry, 10¢.

Rose Pink, 13¢.

Siena, American, Raw, 45¢.

" " Burnt, 16¢ @ 25¢.

" " in oil, 16¢ @ 25¢.

Raw, 15¢ @ 25¢.

Umber, Burnt, 16¢ @ 25¢.

" " in oil, 16¢ @ 25¢.

Raw, 15¢ @ 25¢.

Vermillion, Chinese, 14¢.

" " English, 13¢.

" " Trieste, 13¢.

" " American, Common, 23¢.

White Lead, American, pure dry, 11¢.

" " White, Paris, English, prime, in bbls, 2¢ @ 23¢.

" " Yellow Ochre, French, 2¢ @ 23¢.

" " in oil asst'd cans, 11¢; kegs, 8¢.

" " Vermont, 17¢ @ 25¢.

" " Chrome, 17¢ @ 25¢.

" " in oil, 17¢ @ 25¢.

Zinc White, American No. 1 dry scarce, 10¢.

" " 1, in oil, 12¢.

" " French (Paris), 11¢.

" " in oil, 11¢.

Oils.

Linseed Raw, 9¢. 7 gal. cases, 95¢; bbls, 90¢.

" " Boiled, 100¢.

Whale, Crude, 100¢.

" " Bleached Winter, 100¢.

Sperm, Crude, 100¢.

" " Winter unbleached, 100¢.

" " Bleached, 100¢.

Seal, Extra Refined, 87¢.

Lard, Pure Winter, 75¢.

" " Spring, 75¢.

Cotton Seed, Crude, 59¢.

" " Southern Yellow, 65¢.

" " White, 75¢.

Natural Lubricating, 45¢.

Sundries.

Asphaltum, 8¢.

Benzine, 7 gal. 20¢.

Chalk, 1¢.

" " Block, 1¢.

Dryer, Patent, Am'n, asst'd cans, 11¢; kegs, 9¢.

" " English, 13¢.

Flocks, 50¢.

Frostings, 30¢.

Gine, White, 30¢.

" " Sheet, 30¢.

Glazier's Points, Zinc, 30¢.

Gum, Copal, 30¢.

" " Camar, 30¢.

" " Shellac, English, 50¢.

" " dark, 46¢.

Litharge, 10¢.

Pumice Stone, selected Lump, 5¢ @ 7¢.

" " powdered, 5¢ @ 7¢.

Putty in bladders, 3¢.

" " in bulk, 3¢.

Rotton Stone, soft, English, 3¢.

Sand Paper, crystal, 5¢.

" " flint, 5¢.

Spirits Turpentine, 56¢.

Whiting, Spanish, 13¢.

French Window—1st, 2d, 3d, and 4th qualities.

SINGLE.

SIZES. I. II. III. IV.

6 x 8 to 10 x 12, \$10.75 \$9.75 \$9.00 \$8.25

11 x 14 & 12 x 13, 11.50 9.75 9.00 8.25

10 x 16 to 14 x 26, 12.50 11.50 10.25 9.00

18 x 22, 13.25 12.00 10.75 9.50

15 x 26 to 20 x 30, 15.75 14.00 12.00 10.25

22 x 30 to 24 x 36, 19.75 16.75 13.50 11.50

26 x 36 to 24 x 36, 20.25 17.50 14.00 12.00

26 x 36 to 26 x 44, 22.75 20.25 15.50 13.50

28 x 44 to 30 x 50, 24.00 21.50 16.75 14.75

30 x 52 to 30 x 54, 27.25 24.00 18.75 16.75

30 x 56 to 34 x 60, 29.50 26.25 22.00 19.50

34 x 58 to 34 x 60, 31.50 29.50 25.00 22.50

36 x 60 to 40 x 60, 37.00 32.50 29.50 25.00

DOUBLE.

SIZES. I. II. III. IV.

6 x 8 to 10 x 15, \$16.00 \$14.50 \$13.50 \$12.50

11 x 14 & 12 x 13, 17.25 15.50 14.75 13.25

10 x 16 to 14 x 26, 18.75 17.25 15.50 13.50

18 x 22, 20.00 18.00 16.25 14.25

15 x 26 to 20 x 30, 24.00 21.00 18.00 15.50

22 x 30 to 24 x 36, 30.00 25.25 20.25 17.50

26 x 36 to 24 x 36, 31.00 26.50 21.00 18.50

26 x 36 to 26 x 44, 30.50 26.25 21.50 19.00

28 x 44 to 30 x 50, 36.00 32.25 28.25 24.25

30 x 52 to 30 x 54, 41.00 36.00 32.25 28.25

30 x 56 to 34 x 56, 45.00 39.50 33.00 30.00

34 x 58 to 34 x 60, 48.00 45.00 37.50 34.50

36 x 60 to 40 x 60, 55.00 49.00 45.00 40.00

Sizes above—\$12 per box extra for every five inches.

Discount to the trade 50 per cent.

Fire Brick.

B. KREISCHER & SON,
New York Fire Brick &
STATEN ISLAND
CLAY RETORT WORKS,
Established 1845.

Office, 58 Goerck Street, cor. Delancy Street,
East River, New York.

The largest stock of Fire Brick of all shapes and sizes on hand, and made to order at short notice.

Copala Brick, for McKenzie Patent,
and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and Foundries. Stone Ware and other Fire Clay and Sand, from my own mines at New Jersey and Staten Island, by the cargo or otherwise.

BLACK LEAD

CRUCIBLES.

Manufactured by
ADAM NEWKUMET,
1537 & 1539 N. Front St., Phila., Pa.,
For Steel, Brass, Nickel, Copper, Bronze, &c.
Equal to any in the market, and all guaranteed.
Keeping a full stock of all sizes on hand, and being confident of giving entire satisfaction, we respectfully ask consumers to give us a trial.

Salamander & Albany Fire Brick Works
Rathbone St., Albany, New York.

PALMER, NEWTON & CO.,
Manufacturers of FIRE BRICK of every shape for Gas Works, Tanneries, Lime Kilns, Rolling Mills, Blast Furnaces, Glass Works, Stove, Range and Heater Linings; Fire Clays, Kaolin, Fire Sand, Fire Cement, by cargo or barrel. Orders filled on short notice.

Philadelphia Fire Brick
AND
Clay Retort Works,
AND KENSINGTON FIRE BRICK WORKS.
Office, 23d and Vine, Philadelphia.

PHILIP NEWKUMET,
Successors to JOHN NEWKUMET, Proprietor, manufactures 9-inch Fire Bricks, Tiles, and Blocks, for Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Glass Houses, &c., &c. Articles of every description made to order at short notice, and in a very superior manner.
"CLAY RETORTS FOR SUGAR HOUSES."

TRENTON
Fire-Brick and Terra-Cotta Works.

Fire-Brick, Blast Furnace Blocks
Of all shapes and sizes, Fire Clay, &c.
Stoneware, Drain and Sewer Pipe, from 2 to 15 inches Bore, Terra-Cotta Chimney Tops, Chimney Flues, Garden Vases, &c. Send for Price List and Illustrated Catalogue to
O. O. BOWMAN & CO., Trenton, N. J.
Branch Office, 47 Dey Street, N. Y.

Watson Fire Brick Manufactory,
ESTABLISHED 1836.
JOHN R. WATSON, Perth Amboy New Jersey,
Manufacturer of
FIRE BRICK,
For Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Tanneries, Boiler and Grate Setting, Glass Works, &c.
FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE.

A. HALL & SONS, Perth Amboy, N. J.
ESTABLISHED 1

HILL'S ARCHIMEDEAN" LAWN MOWER.

THE CHAMPION OF THE WORLD.

the first and only Balanced Lawn Mower made and operated by an Adjustable Handle.

The leading Machine both in the United States and Europe, having taken the Gold Medal at the great Fair in Hamburg, Germany, and the Premiums at every test trial in the U. S. Also the Silver Medal at the Cincinnati Exposition of 1872.



Little Croquet Mower for small Lawns and Cemetery Lots, which is the most complete thing of its kind made, and is easily operated by a Miss of ten years. Our list is as follows:

10 inch Croquet Mower, for Miss, \$20.00. 14 inch, for Man, \$25.00.
12 inch, for Boy, \$22.00. 28 inch, for Pony, \$100.00.
32 inch, for one Horse, \$125.00.

Send for circulars. Manufactured by the

Hills Archimedeon Lawn Mower Co.,

Colts Armory, Hartford, Conn.

SEMPLE, BIRGE & CO., General Agents, West of the Mississippi, St. Louis, Mo.

The Improved Excelsior Lawn Mowers,

FOR HAND OR HORSE POWER, MANUFACTURED BY

CHADBORN & COLDWELL MANUFACTURING CO.

P. O. Box 479, NEWBURGH, N. Y.

No.	Price.	Width of Cut.	Grass Box.	Horse Boots.
No. 2 1/2	\$ 75	25 inch.		\$12 per set.
No. 3	125	30 "	\$10	12 "
No. 4	160	35 "	11	12 "
No. 5	200	40 "	12	12 "



No. 0 Hand Mower—Cuts 11 inches. Price, \$16.
No. 1 " " 14 " " " \$25.
No. 2 " " 18 " " " \$30.

The No. 1 for general use, and warranted. The No. 2 for large lawns—when smooth.

The Excelsior is simple and durable. The gearing securely incased and will not clog. Has a full roller, without which no machine is perfect. A bull ratchet—"noiseless"—needs no oiling. Adjustable wrought iron handle. Hangers secured by bolts. The front rollers to these are adjustable, to vary the height of cut. Open balance wiper—with steel knives—the only practicable means of securing strength and ease of draught. Patent iron handle, with attachment on each side of the machine—avoids the serious annoyance of a single wooden handle. The Excelsior Lawn Mower having been before the public for four years, and subjected to the most severe tests, the manufacturers feel warranted in asserting that for *superiority in simplicity of construction and durability* it has no equal. It is *important* in either *Hand* or *Horse* Mowers, that their design should combine the *greatest strength* with least amount of *metal*; we therefore use only the very best material, together with good workmanship, enabling us to produce *Lawn Mowers* light in weight, of easy draught, and at a price within the reach of all.

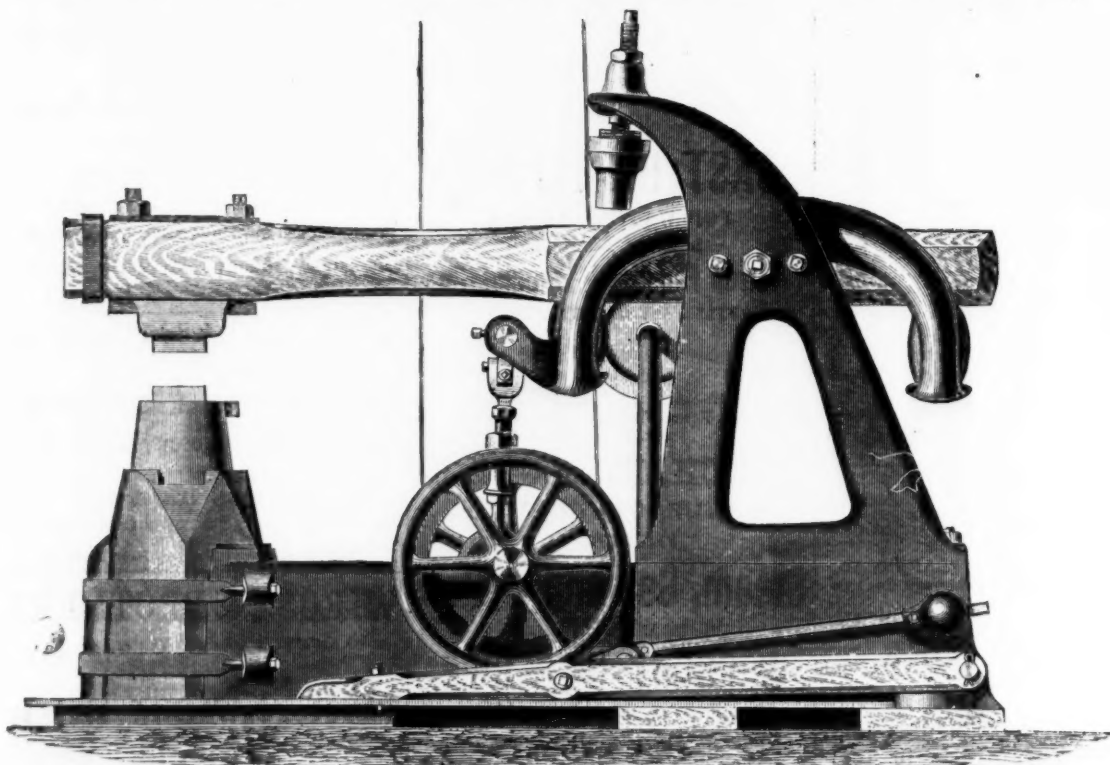
The Excelsior has received the most favorable commendation from all, and the advantages claimed for it over other machines are fully appreciated wherever it is known. To this we add numerous testimonials, but the fact that our sales have greatly increased year by year, is the most convincing proof of its adaptation to the wants of the public.

GRAND SILVER MEDALS AWARDED THE EXCELSIORS AT THE

New England Fair, held at Lowell, Mass., Sept., 1871 and 1872; New Jersey State Fair, held at Waverly, N. J., Sept., 1871 and 1872; the first premium at the New York State Fair, 1871; Western New York Fair, 1871; Ohio State Fair, 1871 and 1872; Northern Ohio Fair, 1871 and 1872; Michigan State Fair, 1871 and 1872; Indiana State Fair, 1871; Wisconsin State Fair, 1871 and 1872; Tennessee State Fair, 1871; Virginia State Fair, 1871; South Carolina State Fair, 1871.

For description of Mowers, and particulars, send for catalogue. Agents wanted. A liberal discount to the trade.

BRADLEY'S CUSHIONED HAMMER.



This Hammer is a great improvement over the old style of helve hammers. It is all made of Iron and Steel except the helve and cushions. It is portable, takes up but little room, and makes no noise except the stroke of the hammer. It takes less power to drive it, and it turns out more and better work. The helve is nicely balanced upon two adjustable hardened steel centers, and there is no bind or friction connected with its action. It will endure more hardships at less expense for repairs, and, consequently, outlasts any other. Its capacity is greatly increased, but not at the expense of its size, convenience or durability. It strikes a more accurate, forcible and elastic blow than any other hammer. It is being used and is particularly adapted for the exceedingly difficult work of swedging cotton spindles; no other hammer has been able to do this work as perfectly and economically. It is the favorite of every hammerman; it promptly obeys his every touch, and he soon regards it as a thing of life. We warrant them as recommended, and refer you to the following parties now using them:

W. H. Haskell & Co., Pawtucket, R. I.
Cole Brothers, Pawtucket, R. I.
American File Co., Pawtucket, R. I.
Fales, Jenks & Son, Pawtucket, R. I.
Providence Tool Co., Providence, R. I.
Nicholson File Co., Providence, R. I.
Woonsocket Iron Foundry, Woonsocket, R. I.
For particulars address

John Berkenhead, Mansfield, Mass.
Steele & Condict, Jersey City, N. J.
Sibley Mfg. Co., Seneca Falls, N. Y.
Cowling & Co., Seneca Falls, N. Y.
Runsey & Co., Seneca Falls, N. Y.
Clapp, Fitch & Co., Auburn, N. Y.
Sweet, Barnes & Co., Syracuse, N. Y.

Ward, Mitchell & Co., Springfield, O.
Robert Doyle, Watseka, Ill.
Furst & Bradley Mfg. Co., Chicago, Ill.
Chicago Plow Co., Chicago, Ill.
Mark H. Richards, Pottstown, Pa.
Peters Bros. Mfg. Co., Marshall, Mich.
Studebaker Bros. Mfg. Co., South Bend, Ind.

BRADLEY MFG. CO., Syracuse, N. Y.



White Lead, &c.



Union White Lead Mfg. Company,

26 Burling Slip, New York.

B. W. How, Secretary. James How, President.

MANUFACTURERS OF

White Lead, Red Lead, Litharge,

Orange Mineral.

Brooklyn White Lead Co.



White Lead, Red Lead and

Litharge.

89 Malden Lane, NEW YORK.

FISHER HOWE, Treas.

JOHN JEWETT & SONS

Manufacturers of the well known Brand of

WHITE LEAD.



TRADE MARK.

Also Manufacturers of

LINSEED OIL

AND FLOOR OIL CLOTHS,

182 Front Street, NEW YORK.



TRADE MARK.

The Atlantic White Lead and Linseed Oil Company,

MANUFACTURERS OF

White Lead (Atlantic), Red Lead

Litharge & Linseed Oil.

ROBERT COLGATE & CO.,

287 Pearl Street, New York.

John T. Lewis & Bros.

No. 231 South Front St.,

PHILADELPHIA.



TRADE MARK.

PURE WHITE LEAD, RED LEAD

Litharge, Orange Mineral,

Linseed Oil

AND PAINTERS' COLORS.



FOR SAMPLE CARDS.

Our Paint is made of the very best material known to painters, viz: White Lead, Zinc and Linseed Oil, chemically combined, and is superior to any paint known to the trade. The advantages being that

It is ready for use.
It is applied with less labor.
It shows a beautiful enamel surface.
It does not chalk or peel off.
It does not run from nail holes or corners.
It is fire proof and water proof.
It covers old work as well as new.
It is the best paint for iron buildings.
It is equal to any for covering brick.
It is a perfect wood preservative.
It is, before dry, does not wash it.
It is durable, retaining its enamel and freshness.

Sold by the Gallon only, in Cans or Barrels.
Office, 43 Chambers St., N. Y.

Cornell Lead Co.,

Cor. Delaware and Virginia Streets, BUFFALO, N. Y.

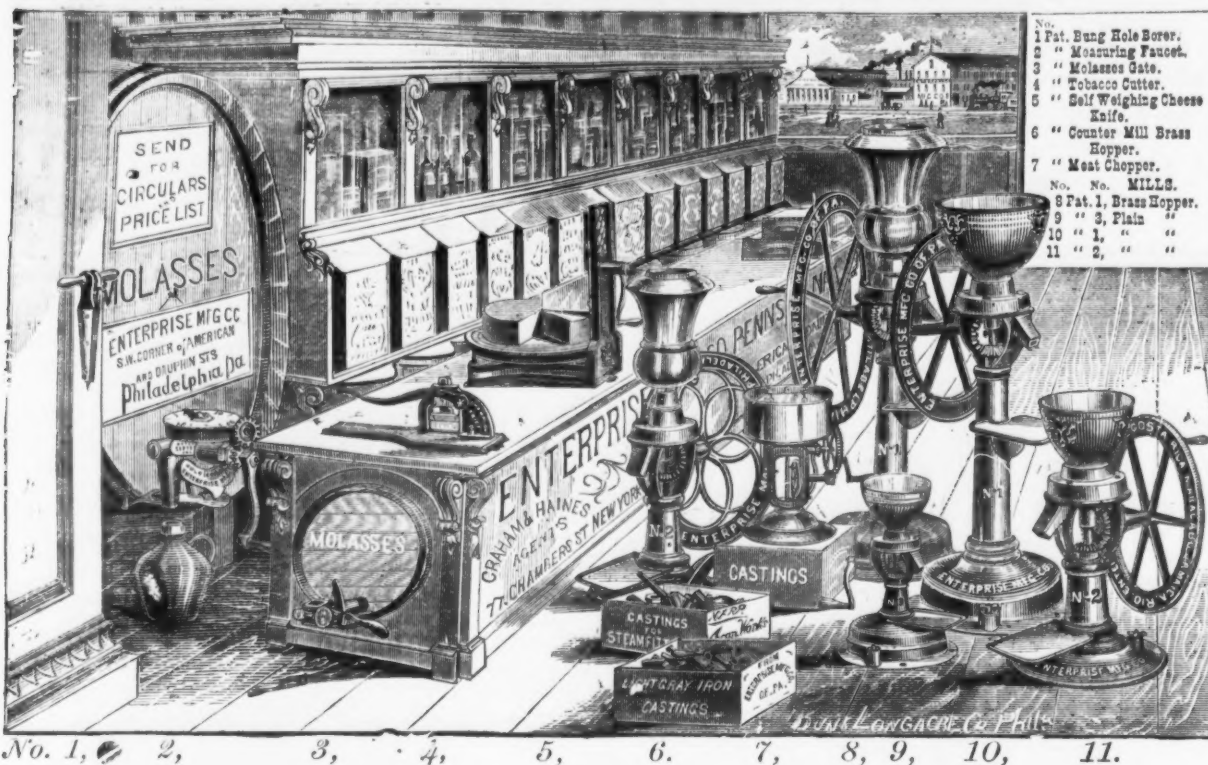


TRADE MARK.

Manufacturers

WHITE LEAD Dry and in Oil,
Lead Pipe, Sheet and Bar Lead.

S. G. CORNELL, Pres. A. P. THOMPSON, Vice-Prest.
S. DOUGLAS CORNELL, Secy.



ENTERPRISE MFG. CO., of Pa.,
HARDWARE MANUFACTURERS,
W. Cor. of American and Dauphin Sts., PHILADELPHIA.

GRAHAM & HAINES, Agents,
88 Chambers St., New York.

SANDUSKY TOOL CO.,

MANUFACTURERS OF

Planes, Plane Irons, Carpenters', Cabinet Makers' and
Coopers' Tools,



Bench, Hand and Tail Serews,
and Chisel,
File and Auger Handles.

SANDUSKY TOOL CO., Sandusky, Ohio, or GRAHAM & HAINES, 88 Chambers Street, N. Y.

Headquarters for

Henry Disston & Sons' Saws,

Hand, Mill, Circular and Cross Cut.

ALSO,

Plumbs and Levels, Try Squares, Gauges, Trowels
and Barker's Reversible Butt.

A full assortment constantly on hand. Address orders to

GRAHAM & HAINES, 88 Chambers Street, N. Y.

Samuel Loring's Tacks and Rivets.

Warehouse, 88 Chambers Street, New York.

A full assortment of

TACKS (all kinds), BRADS, TRUNK, CLOUT, HUNGARIAN and
FINISHING NAILS.

Also, BLACK and TINNED RIVETS always on hand for
immediate delivery, if required.

GRAHAM & HAINES, 88 Chambers Street, New York, Agents.

Philadelphia Tool Co.,



MANUFACTURERS OF

Davis' Patent Duplex Wrench,

A tool well made of Best Materials, combining all the good qualities of a regular Wrench of
equal size with that of at least six pairs of Pipe Tongs. For circulars and price lists, address,
PHILADELPHIA TOOL CO., Office & Works, S. W. cor. 13th & Buttonwood Streets, Phila.,
or GRAHAM & HAINES, Agents, 88 Chambers Street N. Y.

SMITH, BURNS & CO.,

Manufacturers of

Galvanized and Japanned Sheet Iron Goods and Tin Ware.



Coal Hods. Patent Stamped Corrugated Riveted Bottom.
Fry Pans. "Excelsior" Polished.
Excelsior Boller. Best and Cheapest in the market.
Combined Chamber and Commode Pail,
Ash Cans, Galvanized and Japanned,
Galvanized Water Pails, Well Buckets,
Chamber Pails, Tea Kettles, &c., &c.
Toilet Sets. Fancy and Grained.
Chamber Pails, Slop Pails, Foot Tubs, Baths, Water
Carriers, Coolers, &c., &c.
Stamped and Piece Dish Pans and Plain Tin Ware.

Send for Illustrated Catalogue.

Warehouse, 45 CHM Street, between Beekman and Fulton Streets, NEW YORK.

HOWE'S Patent Family Glue Pot.



The Pot and Cup are made of
Cast Iron, like the ordinary Glue
Pot, with a cover and service-
able brush. It is altogether
the best of the cheap Glue Pots
in the market, being in every-
thing except size exactly the
same as those used by mechan-
ics. From the large sales in the
past, we are convinced that it supplies a necessity
long felt where Glue is required—in the family,
store, bank and office. The Glue is prepared in a
manner to prevent all decay or mould. It is always
ready for use, and will save many dollars. They are
packed half a dozen in a box, and twelve boxes in a
case. Price, per doz. \$5, with a liberal discount to
the trade.

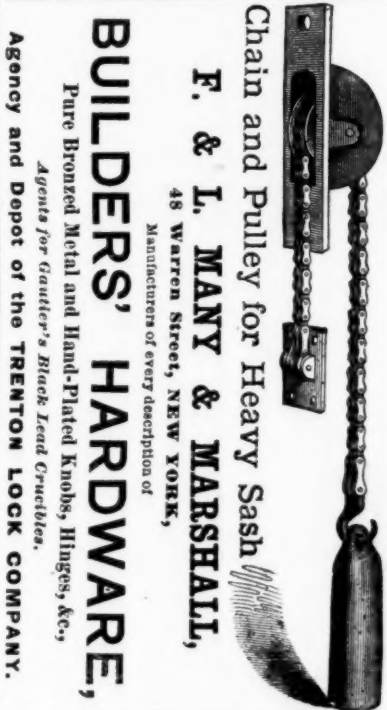
Orders should be addressed to

GRAHAM & HAINES,
88 Chambers St., N. Y.

Or to the manufacturers,

The J. & E. Stevens Co.,
Cromwell, Conn.,

BUILDERS' HARDWARE,
Pure Bronzed Metal and Hand-Plated Knobs, Hinges, &c.,
Agents for Builders' Black Lead Crutches,
Agency and Depot of the TRENTON LOCK COMPANY.



F. & L. MANTY & MARSHALL,
48 Warren Street, NEW YORK,
Manufacturers of every description of
Chain and Pulley for Heavy Sash.

L. S. BOYER & CO.,

Wholesale dealers in

Anthracite & Bituminous Coal & Coke.

Selling Agents for

GEORGE'S CREEK CUMBERLAND COAL,

Mined by the Hampshire & Baltimore Coal Co.

OFFICES: 70 Broadway, N. Y.

36 Exchange Place, Baltimore.

206 South 1st St., Philadelphia

B. W. PERSONS,

Broker and Dealer in

Anthracite and Bituminous Coals,
SCOTCH & AMERICAN PIG IRON,

No. 39 Weybosset Street, Providence, R. I.

Fire Department Supplies.

Hotels, Mills, Public Buildings, &c., furnished with
Hose, Iron Piping, Hydrants and all kinds
of Fire Supplies.

HOSE of every description.

Rubber and Brass Discharge Pipes,
Hats, Caps, Belts, Buckets, Trampets, Axes,
Hose and Ladder Straps, Spanners, &c.

Patent SCREW and RING COUPLING
and SPRAY NOZZLE.

Send for Price List.

ALBERT F. ALLEN, Providence, R. I.

Pipe, Fittings, &c.

McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

BRASS COCKS

For STEAM, WATER
and GAS.

Wrought Iron Pipe & Fittings, Plain and Galvanized
PLUMBERS' MATERIALS.

Illustrated Catalogue sent by express to the Trade on application.

Factory, Paterson, N. J.

56 John Street, N. Y.

POWELL'S PATENT

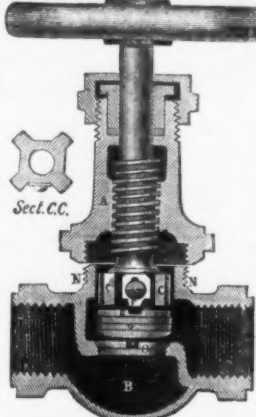
Self-Adjusting Globe Valve.

Adapted for Re-grinding and repairing, without detaching from their position while in use.

These Valves are so constructed
that the working gear of an ANGLE,
GLOBE or CHECK can be all changed
or transposed from one to the other
without in the least affecting their
qualities as a STEAM TIGHT VALVE.
We venture to assert that this can-
not be said of any other Globe
Valve in existence.

It is the only LOOSE DISC VALVE
that can be re-ground without sepa-
rating the Disc from the Stem. It
is the only Re-grinding Valve
whose valve stem is adapted to be
guided to seat, without the aid of
an additional piece.

The Stuffing Box can be packed
with a full head of steam on the
Valve, whether it be closed or open
to its fullest extent. The Screw of



the Nut which connects it to the
Globe is so completely protected
by the steam tight joint at the top
of the neck, that no cement is re-
quired, and it can be unscrewed at
any time without difficulty.

**TO RE-GRIND THE
VALVE**

It will be seen that it is only neces-
sary to release the slotted pin F, by
giving a half turn to the screw
which confines it—drop into the
Slot S of the valve, as seen in cut,
and fasten it there. When the
grinding is accomplished, the
slotted pin is withdrawn to its
original position and fastened, to
be used again when necessary.

Sample Valve sent on application. Send for Circular and Price List.

PANCOAST & MAULE,

227 Pear Street, PHILADELPHIA.

Nelson, Finkel & Co.,

439 East 10th St., New York,

Manufacturers of

Jenkins' Patent

Compression

Valves

AND

Gauge Cocks

Also,

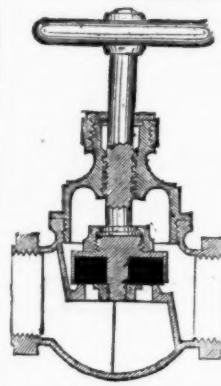
Nelson's Patent

LUBRICATOR.

Warranted the most

reliable and durable

in the country.



CAST IRON PIPES

FOR WATER AND GAS.

Branches Retorts, &c.

Warren Foundry & Machine Co.,
PHILLIPSBURG, NEW JERSEY.

Chas. Gregg Stearns, Pres. A. F. Weaver, Treas.

Geo. Watson, Sec.

**THE CHARLES GREGG
MANUFACTURING CO.**

FITTINGS FOR

Steam, Gas and Water,

PLAIN AND GALVANIZED

WROUGHT IRON PIPE,

Nos. 62 & 64 Gold Street,

NEW YORK.

Business Established, 1806. Incorporated, 1872

GRAFF TUBE WORKS.

WILLIAM GRAFF & CO.,

Manufacturers of Plain and Galvanized

Wrought Iron Pipe

For

Gas, Steam, Water, Oil, &c.,

No. 140 First Ave., PITTSBURGH, PA.

Pipe of any Size, Length or Thickness furnished to
order.

EATON & COLE.

Manufacturers of

Wrought Iron Pipe
Fittings,

BRASS

VALVES,

COCKS, TOOLS, &c.,

68 John Street, NEW YORK.

Sole Agency for the Pacific Coast for

Register's Patent Gauge Cocks,

CONROY, O'CONNOR & CO.,

San Francisco, Cal.

Industrial Tube Works.

ISAAC J. GRIFFITHS & BROS.

Manufacturers of

Wrought Iron & Galvanized Tubes

For Gas, Steam and Water.

Brass and Iron Valves, Cocks,

Cast and Malleable Iron Fittings.

Tubes cut and fitted to plans and specifications.

1529, 1531, 1533 & 1535 South 7th St.,

PHILADELPHIA.

WM. S. CARR & CO.

Sole Manufacturers of

Carr's Patent Plumbers' Goods,

Pumps, Water Closets, Fountains,

Vases, &c.

OFFICE AND WAREHOUSES,

106, 108 & 110 Centre Street,

Factory, Mott Haven, New York.

W. ROSE & BROTHERS

WEST PHILADELPHIA,

Manufacturers of

Plasterers' and Brick

Trowels,

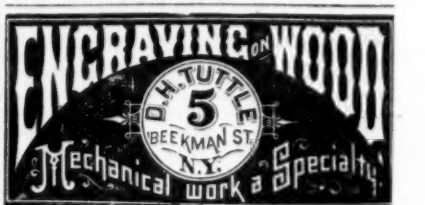
Hammers and Chisels.

ALSO,

Saddlers' Round Knives, etc.,

N. E. cor. 36th & Filbert Sts.

Please send for Price List.



PHILADELPHIA.

(Corrected weekly by Lloyd, Supple & Walton.)

Terms, 20 days. For 60 or 90 days' interest added at 10 per cent. per annum.

ANVILS.

Solid Cast Steel..... 12 1/2
Peter Wright's..... 12 1/2
Wilkinson's..... 11 1/2
Eagle, 11 1/2 cents, currency..... 15 1/2

APPLE PARERS.

Reading..... per doz \$8 50
Turn Table..... per doz 8 00

AXES.

Mann's Light..... Per doz \$13 00 @ 14 00
Hunt's, Light..... \$14 00 @ 15 00
Red Indian, all sizes..... \$13 00 @ 13 50
Red Chief's..... \$13 50 @ 14 00
Crown Prince..... \$14 00 @ 14 50

AUGERS AND AUGER BITS.

Pierce's Patent Twist Bits..... dis 20 @ 20 5/8
Bates & Ives' Bits..... dis 20 @ 20 1/2
Douglas' Bits..... dis 20 @ 20 1/2
Cook's Bits..... dis 20 @ 20 1/2
Bouney's Pat. Hollow Augers..... dis 25 @ 25 1/2
Russell Jennings' Bits..... dis 10 @ 10 1/2
Bates & Ives' Nut Augers..... dis 20 @ 20 1/2
Douglas Nut Augers..... dis 20 @ 20 1/2
Watrous' Ship Augers..... dis 10 @ 10 1/2

LANDERS, FRAYS & CLARK'S.

Landers, Fray & Clark's..... dis 10 @ 15 1/2
Chattillon's..... dis 10 @ 15 1/2
Morton's..... dis 10 @ 15 1/2
Common Spring, with Hook..... per doz \$1 38 @ 2 00

BEVIN BROS. MFG. CO. HAND BELLS.

Extra Light Hand Bells..... dis 50 @ 10 1/2
Other makers, light..... dis 50 @ 10 1/2
Connell's Door Bells..... old list net
Western and Kent's..... dis 50 @ 10 1/2

BORING MACHINES.

Bates' Mfg. Co. complete with augers..... dis 10 @ 15 1/2
Douglas..... dis 10 @ 15 1/2
Common No. Angers..... \$1 25 @ 5 00
Angular, Extra, No. Angers..... \$1 50 @ 5 00

BOLTS.

Eastern Carriage Bolts..... dis 60 @ 30 1/2
Western..... dis 60 @ 30 1/2
Philadelphia Carriage Bolts..... dis 35 @ 10 1/2
Wrought Shutter Bolts..... dis 35 @ 10 1/2
Cast..... dis 35 @ 10 1/2

BRACKS.

Barber's..... dis 30 @ 10 1/2
Bartholomew's..... dis 37 1/2 @ 15 1/2
Spofford's..... dis 37 1/2 @ 15 1/2

BUTTS.

Cast Fast Joint, Narrow..... dis 15 1/2
Broad..... dis 20 1/2
Cast Loose Joint..... dis 20 1/2
Acorn Drilled..... dis 25 @ 10 1/2
Wrought Loose Pin..... dis 20 1/2
Table & Back Flaps..... dis 5 1/2
Narrow..... dis 10 1/2
Lease Joint..... dis 30 1/2
Parker's Blind Butts..... dis 30 1/2
Shepard's..... dis 30 1/2
Clark's..... dis 30 1/2
Lull & Porter's..... dis 30 @ 25 1/2
Palmer's..... dis 30 @ 25 1/2
Garretson's..... dis 40 1/2

CHAINS.

German Halter..... new gold list @ dis 10 1/2
Coil..... new gold list @ dis 10 1/2
Galvanized Pump..... dis 60 @ 20 1/2
English Coil, less than cast..... add 1/2 c.
Common Chain..... 1/2 c. @ dis less.
Best Proof Coil Chain..... 1/2 c. @ dis less.
By the case, 500 lbs., discount 1/2 c. per lb. Common Chain, 1/2 c. per lb. less than proof.

CHISELS.

Socket Framing..... dis 60 @ 60 1/2
Socket Firmer..... dis 60 @ 60 1/2
Tang Firmer..... dis 40 @ 40 1/2
Beatty's Framing and Firmer..... dis 10 @ 10 1/2

CASTER.

Porcelain Wheel..... dis 20 @ 10 1/2
Iron..... dis 20 @ 10 1/2
Brass..... dis 20 @ 10 1/2

CLOTHES WRINGERS.

Reliance advanced March..... per doz \$23 00
Crown..... 7..... 72 00
Monitor..... 7..... 72 00
Universal..... 7..... 72 00
Novelty..... 7..... 72 00
In 5 dozen lots assorted, one time \$70 00 per doz.

COFFEE MILLS.

Common Box and Side advanced April 1873..... dis 15 1/2
Patent..... dis 10 1/2

CUTLERY.

American Pocket (best)..... dis 20 @ 25 1/2
Landers, Fray & Clark, J. Russell & Co., and Lamson & Goodnow Mfg. Co. Manufacturers' net prices

DRAWING KNIVES.

Hart Mfg. Co.'s..... dis 60 @ 60 1/2
Concave Adjustable Hand..... dis 10 1/2
Beatty's..... dis 10 1/2

FILES.

Nicholson's..... new list, \$5 00 to \$2 cur
Bastard..... 5 00 to \$2 cur
Taper..... 5 00 to \$2 cur
Butcher's Mill..... 5 75 to \$2 gold
Bastard..... 5 50 to \$2 gold
Taper..... 5 50 to \$2 gold

ROYAL, NO. 1, 1/4 INCH ROLLERS.

Royal, No. 1, 1/4 inch Rollers..... list \$6 00
No. 2, 6 inch Rollers..... list 7 00

HAMMERS AND HATCHETS.

Yerkes & Plumb's..... dis 5 @ 10 1/2
Hammond & Son's..... dis 5 @ 10 1/2

RINGS.

Strap and T..... dis 15 1/2
Bonney's No. 1 Gate..... dis 25 1/2
No. 2 & 3..... dis 35 1/2

HORSE NAILS.

Ausable Horse Nails..... 27 25 @ 23 22
Globe..... 29 25 @ 24 23
Brundage..... Nos. 5 6 7 8 9 10
Putnam..... 32 28 @ 25 23
On Ausable Globe & Brundage 1000 lb lots..... dis 5 1/2

DOOR (regular manufacture).

Rim and Mortise..... dis 40 1/2
Till and Cupboard..... dis 23 1/2
American Padlocks..... dis 40 1/2
Trunk Locks..... dis 5 @ 10 1/2
Thumb and Rogers Latches..... net @ dis 10 1/2

LONG AND SHORT CUTTER.

Western Pattern..... dis 10 1/2
Pennsylvania Pattern..... dis 10 1/2

ENTERPRISE MFG. CO. MEASURING FAUCETS.

Enterprise Mfg. Co. Measuring Faucets..... dis 20 1/2
Stebbins'..... dis 40 @ 40 1/2
Landers, Fray & Clark's, Petroleum dis 10 @ 10 1/2
Taylor's Petroleum Faucets..... dis 20 @ 20 1/2

RAKES.

Cast Steel Garden..... dis 30 1/2
Malleable..... dis 33 1/2
Wood Head Iron Teeth..... dis 30 @ 40 1/2

RULES.

Steel Squares, new list..... dis 50 1/2
Iron..... dis 50 1/2

SAWS.

Disston's Cross Cut..... dis 12 1/2
Disston's Hand..... dis 7 1/2
Wm. McNeice's Hand, Cross-Cut and Circular, new list..... dis 15 1/2
Boynton's Lightning, new list..... dis 30 1/2

SHOVELS AND SPADES.

Roland's Plain Back, list Feb. 1873..... dis 20 1/2
Oliver and Sons, advanced April 8..... dis 7 1/2
Brady Shovel Co..... dis 7 1/2

RADING (planned face).

Gem..... per gross \$5 00
Onyx..... \$5 00

SCYTHES.

Golden Clipper..... per doz \$11 50
Clipper No. 10..... 10 50
Common Scythes..... per doz \$7 00 @ 10 00

SCREWS.

Iron (list Mar 6)..... dis 50 1/2
Brass (Brass Screw)..... dis 40 1/2

SPRINGS.

Plated Springs, Rogers Bros..... dis 25 @ 25 1/2
Britannia, Parker's and Boardman's, dis 25 @ 25 1/2
German Silver..... net list
Steel..... dis 5 1/2

TRY SQUARES.

Stanley Rule & Level Co..... dis 40 1/2
Disston's..... dis 12 1/2
Stanley or Thru..... dis 40 @ 40 1/2

TACKS, CLOUT AND FINISHING NAILS.

Half Weight Tacks..... dis 70 1/2
by the case..... dis 70 1/2
Clout and Finishing Nails..... 75 1/2
by the case..... dis 75 1/2

THAPS.

Genuine Oneida-Newhouse list..... dis 20 1/2
Imitation..... dis 20 @ 10 1/2

WRENCHES.

Coe's Genuine..... dis 30 1/2
Coe's Imitation Wrought Bar..... dis 30 1/2
Malleable Bar..... dis 30 1/2
Pattern Malleable Bar..... dis 30 1/2
Tafts Wrought Bar..... dis 30 1/2
Tafts Malleable Bar..... dis 30 1/2

WIRE.

No. 0 to 18..... dis 20 @ 22 1/2
No. 19 to 26..... dis 27 1/2 @ 30 1/2
No. 27 to 36..... dis 35 @ 35 1/2
Coppered 0 to 12..... dis 15 @ 20 1/2
Tinned Broom Wire..... dis 15 1/2
Bradley & Co. Office Nos. 19 & 21 South Fourth st., Philadelphia. Price list of Proved and Warranted Chains. Discount 1/2 c. per lb.

SHORT LINK CHAIN.

Size, Per Fathom, Proof, Price, Tons, Per Cb.

1/2 in..... 15 1/2 4 10 1/2
3/4 in..... 19 1/2 5 10 1/2
1 in..... 23 1/2 6 10 1/2
1 1/4 in..... 27 1/2 8 10 1/2
1 1/2 in..... 31 1/2 10 8 1/2
1 3/4 in..... 35 1/2 12 8 1/2
2 in..... 39 1/2 14 8 1/2
2 1/4 in..... 43 1/2 16 8 1/2
2 1/2 in..... 47 1/2 18 8 1/2
2 3/4 in..... 51 1/2 20 8 1/2
3 in..... 55 1/2 22 8 1/2
3 1/4 in..... 59 1/2 24 8 1/2
3 1/2 in..... 63 1/2 26 8 1/2
3 3/4 in..... 67 1/2 28 8 1/2
4 in..... 71 1/2 30 8 1/2
4 1/4 in..... 75 1/2 32 8 1/2
4 1/2 in..... 79 1/2 34 8 1/2
4 3/4 in..... 83 1/2 36 8 1/2
5 in..... 87 1/2 38 8 1/2
5 1/4 in..... 91 1/2 40 8 1/2
5 1/2 in..... 95 1/2 42 8 1/2
5 3/4 in..... 99 1/2 44 8 1/2
6 in..... 103 1/2 46 8 1/2
6 1/4 in..... 107 1/2 48 8 1/2
6 1/2 in..... 111 1/2 50 8 1/2
6 3/4 in..... 115 1/2 52 8 1/2
7 in..... 119 1/2 54 8 1/2
7 1/4 in..... 123 1/2 56 8 1/2
7 1/2 in..... 127 1/2 58 8 1/2
7 3/4 in..... 131 1/2 60 8 1/2
8 in..... 135 1/2 62 8 1/2
8 1/4 in..... 139 1/2 64 8 1/2
8 1/2 in..... 143 1/2 66 8 1/2
8 3/4 in..... 147 1/2 68 8 1/2
9 in..... 151 1/2 70 8 1/2
9 1/4 in..... 155 1/2 72 8 1/2
9 1/2 in..... 159 1/2 74 8 1/2
9 3/4 in..... 163 1/2 76 8 1/2
10 in..... 167 1/2 78 8 1/2
10 1/4 in..... 171 1/2 80 8 1/2
10 1/2 in..... 175 1/2 82 8 1/2
10 3/4 in..... 179 1/2 84 8 1/2
11 in..... 183 1/2 86 8 1/2
11 1/4 in..... 187 1/2 88 8 1/2
11 1/2 in..... 191 1/2 90 8 1/2
11 3/4 in..... 195 1/2 92 8 1/2
12 in..... 199 1/2 94 8 1/2
12 1/4 in..... 203 1/2 96 8 1/2
12 1/2 in..... 207 1/2 98 8 1/2
12 3/4 in..... 211 1/2 100 8 1/2
13 in..... 215 1/2 102 8 1/2
13 1/4 in..... 219 1/2 104 8 1/2
13 1/2 in..... 223 1/2 106 8 1/2
13 3/4 in..... 227 1/2 108 8 1/2
14 in..... 231 1/2 110 8 1/2
14 1/4 in..... 235 1/2 112 8 1/2
14 1/2 in..... 239 1/2 114 8 1/2
14 3/4 in..... 243 1/2 116 8 1/2
15 in..... 247 1/2 118 8 1/2
15 1/4 in..... 251 1/2 120 8 1/2
15 1/2 in..... 255 1/2 122 8 1/2
15 3/4 in..... 259 1/2 124 8 1/2
16 in..... 263 1/2 126 8 1/2
16 1/4 in..... 267 1/2 128 8 1/2
16 1/2 in..... 271 1/2 130 8 1/2
16 3/4 in..... 275 1/2 132 8 1/2
17 in..... 279 1/2 134 8 1/2
17 1/4 in..... 283 1/2 136 8 1/2
17 1/2 in..... 287 1/2 138 8 1/2
17 3/4 in..... 291 1/2 140 8 1/2
18 in..... 295 1/2 142 8 1/2
18 1/4 in..... 299 1/2 144 8 1/2
18 1/2 in..... 303 1/2 146 8 1/2
18 3/4 in..... 307 1/2 148 8 1/2
19 in..... 311 1/2 150 8 1/2
19 1/4 in..... 315 1/2 152 8 1/2
19 1/2 in..... 319 1/2 154 8 1/2
19 3/4 in..... 323 1/2 156 8 1/2
20 in..... 327 1/2 158 8 1/2
20 1/4 in..... 331 1/2 160 8 1/2
20 1/2 in..... 335 1/2 162 8 1/2
20 3/4 in..... 339 1/2 164 8 1/2
21 in..... 343 1/2 166 8 1/2
21 1/4 in..... 347 1/2 168 8 1/2
21 1/2 in..... 351 1/2 170 8 1/2
21 3/4 in..... 355 1/2 172 8 1/2
22 in..... 359 1/2 174 8 1/2
22 1/4 in..... 363 1/2 176 8 1/2
22 1/2 in..... 367 1/2 178 8 1/2
22 3/4 in..... 371 1/2 180 8 1/2
23 in..... 375 1/2 182 8 1/2
23 1/4 in..... 379 1/2 184 8 1/2
23 1/2 in..... 383 1/2 186 8 1/2
23 3/4 in..... 387 1/2 188 8 1/2
24 in..... 391 1/2 190 8 1/2
24 1/4 in..... 395 1/2 192 8 1/2
24 1/2 in..... 399 1/2 194 8 1/2
24 3/4 in..... 403 1/2 196 8 1/2
25 in..... 407 1/2 198 8 1/2
25 1/4 in..... 411 1/2 200 8 1/2
25 1/2 in..... 415 1/2 202 8 1/2
25 3/4 in..... 419 1/2 204 8 1/2
26 in..... 423 1/2 206 8 1/2
26 1/4 in..... 427 1/2 208 8 1/2
26 1/2 in..... 431 1/2 210 8 1/2
26 3/4 in..... 435 1/2 212 8 1/2
27 in..... 439 1/2 214 8 1/2
27 1/4 in..... 443 1/2 216 8 1/2
27 1/2 in..... 447 1/2 218 8 1/2
27 3/4 in..... 451 1/2 220 8 1/2
28 in..... 455 1/2 222 8 1/2
28 1/4 in..... 459 1/2 224 8 1/2
28 1/2 in..... 463 1/2 226 8 1/2
28 3/4 in..... 467 1/2 228 8 1/2
29 in..... 471 1/2 230 8 1/2
29 1/4 in..... 475 1/2 232 8 1/2
29 1/2 in..... 479 1/2 234 8 1/2
29 3/4 in..... 483 1/2 236 8 1/2
30 in..... 487 1/2 238 8 1/2
30 1/4 in..... 491 1/2 240 8 1/2
30 1/2 in..... 495 1/2 242 8 1/2
30 3/4 in..... 499 1/2 244 8 1/2
31 in..... 503 1/2 246 8 1/2
31 1/4 in..... 507 1/2 248 8 1/2
31 1/2 in..... 511 1/2 250 8 1/2
31 3/4 in..... 515 1/2 252 8 1/2
32 in..... 519 1/2 254 8 1/2
32 1/4 in..... 523 1/2 256 8 1/2
32 1/2 in..... 527 1/2 258 8 1/2
32 3/4 in..... 531 1/2 260 8 1/2
33 in..... 535 1/2 262 8 1/2
33 1/4 in..... 539 1/2 264 8 1/2
33 1/2 in..... 543 1/2 266 8 1/2
33 3/4 in..... 547 1/2 268 8 1/2
34 in..... 551 1/2 270 8 1/2
34 1/4 in..... 555 1/2 272 8 1/2
34 1/2 in..... 559 1/2 274 8 1/2
34 3/4 in..... 563 1/2 276 8 1/2
35 in..... 567 1/2 278 8 1/2
35 1/4 in..... 571 1/2 280 8 1/2
35 1/2 in..... 575 1/2 282 8 1/2
35 3/4 in..... 579 1/2 284 8 1/2
36 in..... 583 1/2 286 8 1/2
36 1/4 in..... 587 1/2 288 8 1/2
36 1/2 in..... 591 1/2 290 8 1/2
36 3/4 in..... 595 1/2 292 8 1/2
37 in..... 599 1/2 294 8 1/2
37 1/4 in..... 603 1/2 296 8 1/2
37 1/2 in..... 607 1/2 298 8 1/2
37 3/4 in..... 611 1/2 300 8 1/2
38 in..... 615 1/2 302 8 1/2
38 1/4 in..... 619 1/2 304 8 1/2
38 1/2 in..... 623 1/2 306 8 1/2
38 3/4 in..... 627 1/2 308 8 1/2
39 in..... 631 1/2 310 8 1/2
39 1/4 in..... 635 1/2 312 8 1/2
39 1/2 in..... 639 1/2 314 8 1/2
39 3/4 in..... 643 1/2 316 8 1/2
40 in..... 647 1/2 318 8 1/2
40 1/4 in..... 651 1/2 320 8 1/2
40 1/2 in..... 655 1/2 322 8 1/2
40 3/4 in..... 659 1/2 324 8 1/2
41 in..... 663 1/2 326 8 1/2
41 1/4 in..... 667 1/2 328 8 1/2
41 1/2 in..... 671 1/2 330 8 1/2
41 3/4 in..... 675 1/2 332 8 1/2
42 in..... 679 1/2 334 8 1/2
42 1/4 in..... 683 1/2 336 8 1/2
42 1/2 in..... 687 1/2 338 8 1/2
42 3/4 in..... 691 1/2 340 8 1/2
43 in..... 695 1/2 342 8 1/2
43 1/4 in..... 699 1/2 344 8 1/2
43 1/2 in..... 703 1/2 346 8 1/2
43 3/4 in..... 707 1/2 348 8 1/2
44 in..... 711 1/2 350 8 1/2
44 1/4 in..... 715 1/2 352 8 1/2
44 1/2 in..... 719 1/2 354 8 1/2
44 3/4 in..... 723 1/2 356 8 1/2
45 in..... 727 1/2 358 8 1/2
45 1/4 in..... 731 1/2 360 8 1/2
45 1/2 in..... 735 1/2 362 8 1/2
45 3/4 in..... 739 1/2 364 8 1/2
46 in..... 743 1/2 366 8 1/2
46 1/4 in..... 747 1/2 368 8 1/2
46 1/2 in..... 751 1/2 370 8 1/2
46 3/4 in..... 755 1/2 372 8 1/2
47 in..... 759 1/2 374 8 1/2
47 1/4 in..... 763 1/2 376 8 1/2
47 1/2 in..... 767 1/2 378 8 1/2
47 3/4 in..... 771 1/2 380 8 1/2
48 in..... 775 1/2 382 8 1/2
48 1/4 in..... 779 1/2 384 8 1/2
48 1/2 in..... 783 1/2 386 8 1/2
48 3/4 in..... 787 1/2 388 8 1/2
49 in..... 791 1/2 390 8 1/2
49 1/4 in..... 795 1/2 392 8 1/2
49 1/2 in..... 799 1/2 394 8 1/2
49 3/4 in..... 803 1/2 396 8 1/2
50 in..... 807 1/2 398 8 1/2
50 1/4 in..... 811 1/2 400 8 1/2
50 1/2 in..... 815 1/2 402 8 1/2
50 3/4 in..... 819 1/2 404 8 1/2
51 in..... 823 1/2 406 8 1/2
51 1/4 in..... 827 1/2 408 8 1/2
51 1/2 in..... 831 1/2 410 8 1/2
51 3/4 in..... 835 1/2 412 8 1/2
52 in..... 839 1/2 414 8 1/2
52 1/4 in..... 843 1/2 416 8 1/2
52 1/2 in..... 847 1/2 418 8 1/2
52 3/4 in..... 851 1/2 420 8 1/2
53 in..... 855 1/2 422 8 1/2
53 1/4 in..... 859 1/2 424 8 1/2
53 1/2 in..... 863 1/2 426 8 1/2
53 3/4 in..... 867 1/2 428 8 1/2
54 in..... 871 1/2 430 8 1/2
54 1/4 in..... 875 1/2 432 8 1/2
54 1/2 in..... 879 1/2 434 8 1/2
54 3/4 in..... 883 1/2 436 8 1/2
55 in..... 887 1/2 438 8 1/2
55 1/4 in..... 891 1/2 440 8 1/2
55 1/2 in..... 895 1/2 442 8 1/2
55 3/4 in..... 899 1/2 444 8 1/2
56 in..... 903 1/2 446 8 1/2
56 1/4 in..... 907 1/2 448 8 1/2
56 1/2 in..... 911 1/2 450 8 1/2
56 3/4 in..... 915 1/2 452 8 1/2
57 in..... 919 1/2 454 8 1/2
57 1/4 in..... 923 1/2 456 8 1/2
57 1/2 in..... 927 1/2 458 8 1/2
57 3/4 in..... 931 1/2 460 8 1/2
58 in..... 935 1/2 462 8 1/2
58 1/4 in..... 939 1/2 464 8 1/2
58 1/2 in..... 943 1/2 466 8 1/2
58 3/4 in..... 947 1/2 468 8 1/2
59 in..... 951 1/2 470 8 1/2
59 1/4 in..... 955 1/2 4

Steel.

THREE
1st CLASS PRIZE MEDALS.
CLASSES 1, 21, 22,
Great Exhibition of Industry,
LONDON, 1851.

MEDAL OF HONOUR,
SOCIETY OF ARTS & INDUSTRY,
LONDON, 1856.

1st CLASS
PRIZE MEDAL, CLASS 1st
UNIVERSAL
EXHIBITION OF INDUSTRY
PARIS, 1855.

COCKER BROTHERS

SUCCESSORS TO
SAML COCKER & SON,
(Established 1752.)
SHEFFIELD, ENGLAND

MANUFACTURERS OF
CAST, SHEAR, SHEET, AND BLISTER STEEL, OF EVERY DESCRIPTION.
BEST CAST STEEL WIRE, ADAPTED SPECIALLY FOR MECHANICAL PURPOSES;
Also for ROPES, NEEDLES, FISH HOOKS, PINS, CRINOLINE, &c.

BEST CAST STEEL FILES, SAWS, EDGE TOOLS,
HACKLES, GILLS, CARD CLOTHING, CARD TEETH, HACKLE AND GILL PINS,
FISH HOOKS, NEEDLES, &c.

ALSO
GENERAL MERCHANTS.
Agent, JONATHAN HATTERSLEY, Cincinnati, Ohio

WM. JESSOP & SONS,

MANUFACTURERS OF
STEEL,
AND IMPORTERS OF IRON
SHEFFIELD, ENGLAND.

PRINCIPAL DEPOTS:
NEW YORK, Nos. 91 and 93 John Street. BOSTON, Nos. 133 and 135 Federal Street.
AGENCIES:
PHILADELPHIA, Jas. C. Hand & Co. PROVIDENCE, Cornett, Nightingale & Co.
CHICAGO, Cregar, Adams & Co. ST. LOUIS, Henry Bakewell & Sons.
CINCINNATI, Augustus Wessel. NEW ORLEANS, Folger & Co.
SAN FRANCISCO, Russell & Erwin Manufacturing Co.

F. W. MOSS,

Successor to JOSHUA MOSS & GAMBLE BROTHERS,
MANUFACTURER AND IMPORTER OF
STEEL AND FILES.

Principal Depots: 80 John Street, New York, and 512 Commerce Street, Philadelphia.
MOSS & GAMBLE SUPERIOR C. S. "FULL WEIGHT" FILES,
Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.
WARRANTED CAST STEEL, especially adapted for DIES and TURN-
PUNCHES, and all kinds of MACHINISTS' TOOLS.
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools,
warranted not to crack in hardening Taps of any size.
Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.
English Spring and Plow Plate Steel.
Also, manufacturer of
Sheet Cast Steel, Shear, German, Round Machinery, Hammer, Fork and Shovel Steel
And GENERAL MERCHANT.
A. M. F. WATSON, General Agent.

WILSON HAWKSWORTH, ELLISON & CO.,

MANUFACTURERS OF
STEEL, STEEL WIRE, &C.,
AND GENERAL MERCHANTS,
CARLISLE WORKS, SHEFFIELD, ENGLAND.

AGENCIES:
New York, 72 John Street.
Philadelphia, 505 Commerce Street.
Boston, 6 and 8 Liberty Square.

BARROW HEMATITE STEEL COMPANY

LIMITED.
BARROW IN FURNESS,
LANCASHIRE, England
MANUFACTURERS OF
STEEL RAILS, TYRES, WHEELS,
Axles, Shafting, Boiler and Ship Plates, Bessemer Pig Iron, &c., &c.
CHAS. CONGREVE & SON,
SOLE AGENTS FOR THE U. S.,
104 and 106 John Street, opposite Child Street, NEW YORK.

J. & RILEY CARR,

MANUFACTURERS OF SUPERIOR
STEEL
For Tools, Cutlery, Saws, Files, Augers, Gimbles, &c.; Sheet Cast Steel for
SPRINGS AND STAMPING COLD;
ALSO THE CELEBRATED
DOG BRAND FILES,
Unsurpassed, if equaled, in quality.
Bailey Lane Works, Sheffield, England.
Warehouse 82 John St., New York.
Established 1810.
HENRY MOORE, Attorney.

Steel.

SANDERSON BROTHERS & COMPANY,

(LIMITED)
MANUFACTURERS OF THE
CELEBRATED CAST STEEL,
WARRANTED MOST SUPERIOR FOR TOOLS.

DARNALL WORKS,
ATTERCLIFFE FORGE,
WEST STREET WORKS,

SHEFFIELD, ENGLAND.

IMPORTERS OF FILES,

AND
AGENTS FOR ARMITAGE'S GENUINE MOUSEHOLE ANVILS.
NEW YORK, Edward Frith, 16 Cliff. NEW ORLEANS, Rich'd Rhodes, 71 Camp.
BOSTON, H. L. Richards, 18 Battery March. BALTIMORE, Md., Wm. H. Cole.
PHILADELPHIA, Wm. H. Sowers. MONTREAL, Saint Paul St.
CLEVELAND, O., Cleveland, Brown & Co. NEW HAVEN, Ct., Atwater, Wheeler & Co.

FRANCIS HOBSON & SON,

97 John Street, NEW YORK,

Sole Manufact'rs of "CHOICE" Extra Cast Steel.

Manufacturers of all Descriptions of Steel.
Manufacturers of Every Kind of Steel Wire.
Don Works, Sheffield, England.

JOHN HOGAN, Agent.

S. & C. WARDLOW,

MANUFACTURERS OF THE CELEBRATED
**Cast and Double Shear
STEEL,**

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving,
Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs,
Saws and Tools of every variety.

SHEFFIELD, ENGLAND.

Office of S. & C. WARDLOW, 13 Gold Street, New York.

*In calling the attention of consumers of Steel in
any of the various above enumerated, we would respectfully assure
them of our ability to supply an article that cannot be equalled in
quality, temper, and adaptation in all respects to the various purposes
for which it may be required. Half a century of practical expe-
rience in all departments of Steel manufacture, a long established
reputation in England, and the Continent of Europe, and in the Eastern
States principally of this Country, encourage us to solicit a universal
trial of our Steel for the above or other purposes for which a first
class material in quality, temper, and durability is needed.*

G. SANDERSON & CO.,

Manufacturers of all descriptions of

STEEL.

Bailey Street and
Broad Lane Steel Works, SHEFFIELD, ENGLAND.

Particular attention is paid to quality and temper for

Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.
ALSO STEEL of superior quality for Turning Tools, Taps, Dies, Drills, &c.
Hot and Cold Rolled Sheets for Clock Springs, Corset Clasps, Pens, &c.
Makers of the Celebrated ROCK BORING DRILL STEEL.
Warehouse, 96 John Street, New York.

JOHN A. CRISWOLD & CO.,

Troy, N. Y.

J. A. CRISWOLD. E. CORNING. E. CORNING, Jr. C. CRISWOLD.

Rensselaer Iron Works,
Bessemer Steel Works,

Fort Edward Blast Furnace,
And Columbia Blast Furnace.

MANUFACTURERS OF
Pig Iron, Railroad Iron, Merchant and Ship Iron,
BESSEMER STEEL RAILS, AXLES, TIRES, SHAFTING,
PLATES AND STEEL FORGINGS OF ALL DESCRIPTIONS.

D. G. GAUTIER & CO.,

MANUFACTURERS OF

Hammered and Rolled STEEL of every description,
JERSEY CITY, NEW JERSEY.

DUDLEY G. GAUTIER.

JOSIAH H. GAUTIER.

A. J. NELLIS & CO., Pittsburgh, Pa.

MANUFACTURERS OF

Agricultural Steels
and Irons

OF ALL KINDS AND SIZES.
BEVELED, BOLTED, FIN-
ISHED AND TEMPERED TO
SUIT ALL KINDS OF SOIL.

Nellis' Original Horse Hay
Fork Improved.

Nellis' Grapple and Pulleys
Send for P. M. Phlet.

With the exception of our Horse Hay Fork and Fixtures we make no
complete implement. Agricultural Steels and Irons we make ex-
clusively. From the universal approval our goods have secured by actual
test in the hands of implement makers and farmers from the Atlantic
to the Pacific, and with our facilities, experience and improvements,
we frankly assure the Trade of our ability to meet the requirements of
the age. All of our Steel Goods have imprint of our Trade Mark.



Steel.

Sheffield Steel Works.

(Established in 1818.)
SINGER, NIMICK & CO.

Pittsburgh, Pa.,
Manufacturers of Extra Quality Tool
CAST STEEL,
Patent Rolled
SAW PLATES,
All descriptions of Cast and German
Spring and Plow Steel
Elliptic and Side Springs, Seat Springs,
AXLES, STEEL TIRE,
Plow Wings, Shares, Cultivators,
Reaper Bars, Crow Bars, &c., &c.
Warehouse, 83 Water and 100 First Streets.

ISAAC JENKS,

Minerva Iron & Steel Works,
Wolverhampton, England,

MANUFACTURER OF
"Jenks' Spring Steel," and Cast
Spring Steel,
Also, TIRE, TOE CORK, SLEIGH SHOE, BLISTER
AND PLOW STEEL.

VAN WART & McCOY,

SOLE AGENTS,
43 Chambers St., New York.
A full assortment of "Jenks' Spring Steel," in stock.

MILLER, BARR & PARKIN,

Crescent Steel Works,

PITTSBURGH, PA.,
Manufacturers of all descriptions of

STEEL

EQUAL TO ANY IN THE MARKET.

Office.....339 Liberty St.,

PITTSBURGH, PA.

Gunpowder.

GUNPOWDER.

DUPONT'S

Sporting, Shipping, and Mining
POWDER.

DUPONT'S GUNPOWDER MILLS,

ESTABLISHED IN 1801,

Have maintained their great reputation for 70
years. Manufacture the

Celebrated Eagle Ducking, Eagle Rifle
and Diamond Grain Powder.
Also, SPORTING, MINING SHIPPING, AND BLAST-
ING POWDER

of all kinds and descriptions.
For sale in all parts of the country. Represent-
ed by

F. L. KNEELAND,

70 Wall Street, NEW YORK.

GUN-POWDER

LAFLIN & RAND POWDER CO.,
21 Park Row, New York,

invite the attention of the the Hardware Trade to
their facilities for delivering

BLASTING, MINING and RIFLE POWDER

IN EVERY PART OF THE UNITED STATES,
from having agencies and magazines at all prominent
points, beside our works at

Newburg, Saugerties, Kingston, and
Catskill, N. Y.; Scranton, Carbon-
dale and Pottsville, Pa.; Balti-
more, Md., and Plattsville, Wis.

The superiority is well known of our brands
Rifle Powder:

Orange Rifle, Orange Ducking
Lightning, Audubon.

SAFETY-FUSE at wholesale.

Steel.

HUSSEY, WELLS & CO.

MANUFACTURERS OF ALL DESCRIPTIONS OF

CAST STEEL,

EXCLUDING

Best Refined Steel for Edge Tools.

PARTICULAR ATTENTION PAID TO THE MANUFACTURE OF STEEL FOR

Railroad Supplies, Homogeneous Plates

FOR LOCOMOTIVES, BOILERS AND FIRE BOXES,

Smoke-Stack Steel, Cast Steel Forgings for Crank Pins, Car Axles, &c.

ALSO, MANUFACTURERS OF THE CELEBRATED BRAND

"Hussey, Wells & Co. Cast Spring Steel,"

For Elliptic Springs for Railroad Cars & Locomotives.

PENN AND SEVENTEENTH STS., PITTSBURGH, PA.

BRANCH OFFICES:

30 Gold St., New York. 139 & 141 Federal St., Boston. 88 Michigan Ave., Chicago.

Pittsburgh Steel Works

ESTABLISHED IN 1845.

ANDERSON & WOODS,

MANUFACTURERS OF

BEST REFINED CAST STEEL,

Cast and German Plow and Spring Steel,

FIRST AVE., AND ROSS ST., PITTSBURGH.

BRANCH HOUSES:

Nos. 74 and 75 North Street, Boston. C. H. WHITNEY & SON, 142 Greenwich Street, New York.
W. F. POTTS, SON & CO., 125 Market Street, Philadelphia.

First Prize awarded at Fair of American Institute, 1870.

CHROME STEEL COMPANY,

MANUFACTURERS OF BEST

CAST STEEL,

WARRANTED SUPERIOR TO ANY STEEL IN THE MARKET—EITHER ENGLISH OR AMERICAN—FOR EVERY PURPOSE.

Works and Offices—Kent Avenue and Keap Street, Brooklyn, E. D.
W. W. W. WOOD, President. C. P. HAUGHIAN, Superintendent.

LABELLE STEEL WORKS.

REITER, LAVELY & CO.,

MANUFACTURERS OF ALL KINDS OF

STEEL.

Also, Springs, Axles, Rake Teeth, &c.

OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.
Post Office Address, Pittsburgh, Pa.

New Jersey Steel and Iron Company.

Trenton, N. J.,

Represented by COOPER, HEWITT & CO., 17 Burling Slip, New York,

MAKERS OF

ROLLED IRON BEAMS.

Channel Bars, the Trenton Steel Top Rails, &c., &c. Refined Iron, Brazier and Wire Rods.

ALSO,

THE MARTIN STEEL,

For Machinery Uses and Fire-Box Plates.

Fort Pitt Steel Works

Reese, Graff & Woods.

E. C. MERRILL, West Charleston, Vt.

Patentee and Manufacturer of the Cosmopolitan Solid Emery Wheels.

Saw Gummars, Artificial Stone for Building and Ornamental Purposes,
Diamond Turning Tools, Emery Wheel Machinery, &c.

OFFICES: (Boston, 114 & 116 Elliot Street. R. R. Wheeler, Agent
New York, 91 Liberty St.)

A complete assortment of sizes, grades, &c., constantly on hand. The Cosmopolitan Emery Wheels have taken the Highest Awards at every Fair where they have been exhibited, viz.: N. Y. Institute, 1872; New England Agricultural and Mechanical Fairs, held at Lowell, Mass., and the Vermont State Fairs for the past two years.
Send for Prices. A liberal discount made to the trade.

Chicago Metal Market.

(Reported by Cragin, Bros. & Co., 141, 143, and 145 Lake street.)

Tin Plate.			
IX, 10x14, Coke.....	\$14 50	IX X, 14x20, Charcoal.....	22 50
IX, 10x14, Charcoal.....	15 50	IX X X, 14x20, ".....	25 50
IX, 10x14, ".....	18 50	IX X X X, 14x20, ".....	28 50
IX, 12x12, Coke.....	16 00	IX, 14x14, ".....	30 00
IX, 12x12, Charcoal.....	16 00	IX, 10x14, ".....	15 50
IX, 12x12, ".....	19 00	IX, 10x14, ".....	15 50
IX, 14x20, Coke.....	15 00	IX, 10x14, ".....	15 50
IX, 14x20, Charcoal.....	16 50	IX X X, ".....	21 50
IX, 14x20, ".....	19 50	D X X X, ".....	24 50
IX, 14x20, Coke Roofing.....	15 00		
IX, 14x20, Charcoal Roofing.....	15 00		
IX, 14x20, ".....	30 50		
IX, 20x28, ".....	30 50		
Pig Tin.		Bar Tin.	
Large, 60 lb.....	42c		44c
Small, 30 lb.....	40c		
Zinc.		In sheets.	
In casks 100 lbs.....	11c	Slab.....	11 1/2c
Small, 50 lb.....	11 1/2c		3c
Copper.			
Copper Bottoms.....	45c		
Sheathing Copper.....	45c		
Planished Copper, 14x56, 14x60, 14x64, 14x68, 14x72, 14x76, 14x80, 14x84, 14x88, 14x92, 14x96, 14x100, 14x104, 14x108, 14x112, 14x116, 14x120, 14x124, 14x128, 14x132, 14x136, 14x140, 14x144, 14x148, 14x152, 14x156, 14x160, 14x164, 14x168, 14x172, 14x176, 14x180, 14x184, 14x188, 14x192, 14x196, 14x200, 14x204, 14x208, 14x212, 14x216, 14x220, 14x224, 14x228, 14x232, 14x236, 14x240, 14x244, 14x248, 14x252, 14x256, 14x260, 14x264, 14x268, 14x272, 14x276, 14x280, 14x284, 14x288, 14x292, 14x296, 14x300, 14x304, 14x308, 14x312, 14x316, 14x320, 14x324, 14x328, 14x332, 14x336, 14x340, 14x344, 14x348, 14x352, 14x356, 14x360, 14x364, 14x368, 14x372, 14x376, 14x380, 14x384, 14x388, 14x392, 14x396, 14x400, 14x404, 14x408, 14x412, 14x416, 14x420, 14x424, 14x428, 14x432, 14x436, 14x440, 14x444, 14x448, 14x452, 14x456, 14x460, 14x464, 14x468, 14x472, 14x476, 14x480, 14x484, 14x488, 14x492, 14x496, 14x500, 14x504, 14x508, 14x512, 14x516, 14x520, 14x524, 14x528, 14x532, 14x536, 14x540, 14x544, 14x548, 14x552, 14x556, 14x560, 14x564, 14x568, 14x572, 14x576, 14x580, 14x584, 14x588, 14x592, 14x596, 14x600, 14x604, 14x608, 14x612, 14x616, 14x620, 14x624, 14x628, 14x632, 14x636, 14x640, 14x644, 14x648, 14x652, 14x656, 14x660, 14x664, 14x668, 14x672, 14x676, 14x680, 14x684, 14x688, 14x692, 14x696, 14x700, 14x704, 14x708, 14x712, 14x716, 14x720, 14x724, 14x728, 14x732, 14x736, 14x740, 14x744, 14x748, 14x752, 14x756, 14x760, 14x764, 14x768, 14x772, 14x776, 14x780, 14x784, 14x788, 14x792, 14x796, 14x800, 14x804, 14x808, 14x812, 14x816, 14x820, 14x824, 14x828, 14x832, 14x836, 14x840, 14x844, 14x848, 14x852, 14x856, 14x860, 14x864, 14x868, 14x872, 14x876, 14x880, 14x884, 14x888, 14x892, 14x896, 14x900, 14x904, 14x908, 14x912, 14x916, 14x920, 14x924, 14x928, 14x932, 14x936, 14x940, 14x944, 14x948, 14x952, 14x956, 14x960, 14x964, 14x968, 14x972, 14x976, 14x980, 14x984, 14x988, 14x992, 14x996, 14x1000, 14x1004, 14x1008, 14x1012, 14x1016, 14x1020, 14x1024, 14x1028, 14x1032, 14x1036, 14x1040, 14x1044, 14x1048, 14x1052, 14x1056, 14x1060, 14x1064, 14x1068, 14x1072, 14x1076, 14x1080, 14x1084, 14x1088, 14x1092, 14x1096, 14x1100, 14x1104, 14x1108, 14x1112, 14x1116, 14x1120, 14x1124, 14x1128, 14x1132, 14x1136, 14x1140, 14x1144, 14x1148, 14x1152, 14x1156, 14x1160, 14x1164, 14x1168, 14x1172, 14x1176, 14x1180, 14x1184, 14x1188, 14x1192, 14x1196, 14x1200, 14x1204, 14x1208, 14x1212, 14x1216, 14x1220, 14x1224, 14x1228, 14x1232, 14x1236, 14x1240, 14x1244, 14x1248, 14x1252, 14x1256, 14x1260, 14x1264, 14x1268, 14x1272, 14x1276, 14x1280, 14x1284, 14x1288, 14x1292, 14x1296, 14x1300, 14x1304, 14x1308, 14x1312, 14x1316, 14x1320, 14x1324, 14x1328, 14x1332, 14x1336, 14x1340, 14x1344, 14x1348, 14x1352, 14x1356, 14x1360, 14x1364, 14x1368, 14x1372, 14x1376, 14x1380, 14x1384, 14x1388, 14x1392, 14x1396, 14x1400, 14x1404, 14x1408, 14x1412, 14x1416, 14x1420, 14x1424, 14x1428, 14x1432, 14x1436, 14x1440, 14x1444, 14x1448, 14x1452, 14x1456, 14x1460, 14x1464, 14x1468, 14x1472, 14x1476, 14x1480, 14x1484, 14x1488, 14x1492, 14x1496, 14x1500, 14x1504, 14x1508, 14x1512, 14x1516, 14x1520, 14x1524, 14x1528, 14x1532, 14x1536, 14x1540, 14x1544, 14x1548, 14x1552, 14x1556, 14x1560, 14x1564, 14x1568, 14x1572, 14x1576, 14x1580, 14x1584, 14x1588, 14x1592, 14x1596, 14x1600, 14x1604, 14x1608, 14x1612, 14x1616, 14x1620, 14x1624, 14x1628, 14x1632, 14x1636, 14x1640, 14x1644, 14x1648, 14x1652, 14x1656, 14x1660, 14x1664, 14x1668, 14x1672, 14x1676, 14x1680, 14x1684, 14x1688, 14x1692, 14x1696, 14x1700, 14x1704, 14x1708, 14x1712, 14x1716, 14x1720, 14x1724, 14x1728, 14x1732, 14x1736, 14x1740, 14x1744, 14x1748, 14x1752, 14x1756, 14x1760, 14x1764, 14x1768, 14x1772, 14x1776, 14x1780, 14x1784, 14x1788, 14x1792, 14x1796, 14x1800, 14x1804, 14x1808, 14x1812, 14x1816, 14x1820, 14x1824, 14x1828, 14x1832, 14x1836, 14x1840, 14x1844, 14x1848, 14x1852, 14x1856, 14x1860, 14x1864, 14x1868, 14x1872, 14x1876, 14x1880, 14x1884, 14x1888, 14x1892, 14x1896, 14x1900, 14x1904, 14x1908, 14x1912, 14x1916, 14x1920, 14x1924, 14x1928, 14x1932, 14x1936, 14x1940, 14x1944, 14x1948, 14x1952, 14x1956, 14x1960, 14x1964, 14x1968, 14x1972, 14x1976, 14x1980, 14x1984, 14x1988, 14x1992, 14x1996, 14x2000, 14x2004, 14x2008, 14x2012, 14x2016, 14x2020, 14x2024, 14x2028, 14x2032, 14x2036, 14x2040, 14x2044, 14x2048, 14x2052, 14x2056, 14x2060, 14x2064, 14x2068, 14x2072, 14x2076, 14x2080, 14x2084, 14x2088, 14x2092, 14x2096, 14x2100, 14x2104, 14x2108, 14x2112, 14x2116, 14x2120, 14x2124, 14x2128, 14x2132, 14x2136, 14x2140, 14x2144, 14x2148, 14x2152, 14x2156, 14x2160, 14x2164, 14x2168, 14x2172, 14x2176, 14x2180, 14x2184, 14x2188, 14x2192, 14x2196, 14x2200, 14x2204, 14x2208, 14x2212, 14x2216, 14x2220, 14x2224, 14x2228, 14x2232, 14x2236, 14x2240, 14x2244, 14x2248, 14x2252, 14x2256, 14x2260, 14x2264, 14x2268, 14x2272, 14x2276, 14x2280, 14x2284, 14x2288, 14x2292, 14x2296, 14x2300, 14x2304, 14x2308, 14x2312, 14x2316, 14x2320, 14x2324, 14x2328, 14x2332, 14x2336, 14x2340, 14x2344, 14x2348, 14x2352, 14x2356, 14x2360, 14x2364, 14x2368, 14x2372, 14x2376, 14x2380, 14x2384, 14x2388, 14x2392, 14x2396, 14x2400, 14x2404, 14x2408, 14x2412, 14x2416, 14x2420, 14x2424, 14x2428, 14x2432, 14x2436, 14x2440, 14x2444, 14x2448, 14x2452, 14x2456, 14x2460, 14x2464, 14x2468, 14x2472, 14x2476, 14x2480, 14x2484, 14x2488, 14x2492, 14x2496, 14x2500, 14x2504, 14x2508, 14x2512, 14x2516, 14x2520, 14x2524, 14x2528, 14x2532, 14x2536, 14x2540, 14x2544, 14x2548, 14x2552, 14x2556, 14x2560, 14x2564, 14x2568, 14x2572, 14x2576, 14x2580, 14x2584, 14x2588, 14x2592, 14x2596, 14x2600, 14x2604, 14x2608, 14x2612, 14x2616, 14x2620, 14x2624, 14x2628, 14x2632, 14x2636, 14x2640, 14x2644, 14x2648, 14x2652, 14x2656, 14x2660, 14x2664, 14x2668, 14x2672, 14x2676, 14x2680, 14x2684, 14x2688, 14x2692, 14x2696, 14x2700, 14x2704, 14x2708, 14x2712, 14x2716, 14x2720, 14x2724, 14x2728, 14x2732, 14x2736, 14x2740, 14x2744, 14x2748, 14x2752, 14x2756, 14x2760, 14x2764, 14x2768, 14x2772, 14x2776, 14x2780, 14x2784, 14x2788, 14x2792, 14x2796, 14x2800, 14x2804, 14x2808, 14x2812, 14x2816, 14x2820, 14x2824, 14x2828, 14x2832, 14x2836, 14x2840, 14x2844, 14x2848, 14x2852, 14x2856, 14x2860, 14x2864, 14x2868, 14x2872, 14x2876, 14x2880, 14x2884, 14x2888, 14x2892, 14x2896, 14x2900, 14x2904, 14x2908, 14x2912, 14x2916, 14x2920, 14x2924, 14x2928, 14x2932, 14x2936, 14x2940, 14x2944, 14x2948, 14x2952, 14x2956, 14x2960, 14x2964, 14x2968, 14x2972, 14x2976, 14x2980, 14x2984, 14x2988, 14x2992, 14x2996, 14x3000, 14x3004, 14x3008, 14x3012, 14x3016, 14x3020, 14x3024, 14x3028, 14x3032, 14x3036, 14x3040, 14x3044, 14x3048, 14x3052, 14x3056, 14x3060, 14x3064, 14x3068, 14x3072, 14x3076, 14x3080, 14x3084, 14x3088, 14x3092, 14x3096, 14x3100, 14x3104, 14x3108, 14x3112, 14x3116, 14x3120, 14x3124, 14x3128, 14x3132, 14x3136, 14x3140, 14x3144, 14x3148, 14x3152, 14x3156, 14x3160, 14x3164, 14x3168, 14x3172, 14x3176, 14x3180, 14x3184, 14x3188, 14x3192, 14x3196, 14x3200, 14x3204, 14x3208, 14x3212, 14x3216, 14x3220, 14x3224, 14x3228, 14x3232, 14x3236, 14x3240, 14x3244, 14x3248, 14x3252, 14x3256, 14x3260, 14x3264, 14x3268, 14x3272, 14x3276, 14x3280, 14x3284, 14x3288, 14x3292, 14x3296, 14x3300, 14x3304, 14x3308, 14x3312, 14x3316, 14x3320, 14x3324, 14x3328, 14x3332, 14x3336, 14x3340, 14x3344, 14x3348, 14x3352, 14x3356, 14x3360, 14x3364, 14x3368, 14x3372, 14x3376, 14x3380, 14x3384, 14x3388, 14x3392, 14x3396, 14x3400, 14x3404, 14x3408, 14x3412, 14x3416, 14x3420, 14x3424, 14x3428, 14x3432, 14x3436, 14x3440, 14x3444, 14x3448, 14x3452, 14x3456, 14x3460, 14x3464, 14x3468, 14x3472, 14x3476, 14x3480, 14x3484, 14x3488, 14x3492, 14x3496, 14x3500, 14x3504, 14x3508, 14x3512, 14x3516, 14x3520, 14x3524, 14x3528, 14x3532, 14x3536, 14x3540, 14x3544, 14x3548, 14x3552, 14x3556, 14x3560, 14x3564, 14x3568, 14x3572, 14x3576, 14x3580, 14x3584, 14x3588, 14x3592, 14x3596, 14x3600, 14x3604, 14x3608, 14x3612, 14x3616, 14x3620, 14x3624, 14x3628, 14x3632, 14x3636, 14x3640, 14x3644, 14x3648, 14x3652, 14x3656, 14x3660, 14x3664, 14x3668, 14x3672, 14x3676, 14x3680, 14x3684, 14x3688, 14x3692, 14x3696, 14x3700, 14x3704, 14x3708, 14x3712, 14x3716, 14x3720, 14x3724, 14x3728, 14x3732, 14x3736, 14x3740, 14x3744, 14x3748, 14x3752, 14x3756, 14x3760, 14x3764, 14x3768, 14x3772, 14x3776, 14x3780, 14x3784, 14x3788, 14x3792, 14x3796, 14x3800, 14x3804, 14x3808, 14x3812, 14x3816, 14x3820, 14x3824, 14x3828, 14x3832, 14x3836, 14x3840, 14x3844, 14x3848, 14x3852, 14x3856, 14x3860, 14x3864, 14x3868, 14x3872, 14x3876, 14x3880, 14x3884, 14x3888, 14x3892, 14x3896, 14x3900, 14x3904, 14x3908, 14x3912, 14x3916, 14x3920, 14x3924, 14x3928, 14x3932, 14x3936, 14x3940, 14x3944, 14x3948, 14x3952, 14x3956, 14x3960, 14x3964, 14x3968, 14x3972, 14x3976, 14x3980, 14x3984, 14x3988, 14x3992, 14x3996, 14x4000, 14x4004, 14x4008, 14x4012, 14x4016, 14x4020, 14x4024, 14x4028, 14x4032, 14x4036, 14x4040, 14x4044, 14x4048, 14x4052, 14x4056, 14x4060, 14x4064, 14x4068, 14x4072, 14x4076, 14x4080, 14x4084, 14x4088, 14x4092, 14x4096, 14x4100, 14x4104, 14x4108, 14x4112, 14x4116, 14x4120, 14x4124, 14x4128, 14x4132, 14x4136, 14x4140, 14x4144, 14x4148, 14x4152, 14x4156, 14x4160, 14x4164, 14x4168, 14x4172, 14x4176, 14x4180, 14x4184, 14x4188, 14x4192, 14x4196, 14x4200, 14x4204, 14x4208, 14x4212, 14x4216, 14x4220, 14x4224, 14x4228, 14x4232, 14x4236, 14x4240, 14x4244, 14x4248, 14x4252, 14x4256, 14x4260, 14x4264, 14x4268, 14x4272, 14x4276, 14x4280, 14x4284, 14x4288, 14x4292, 14x4296, 14x4300, 14x4304, 14x4308, 14x4312, 14x4316, 14x4320, 14x4324, 14x4328, 14x4332, 14x4336, 14x4340, 14x4344, 14x4348, 14x4352, 14x4356, 14x4360, 14x4364, 14x4368, 14x4372, 14x4376, 14x4380, 14x4384, 14x4388, 14x4392, 14x4396, 14x4400, 14x4404, 14x4408, 14x4412, 14x4416, 14x4420, 14x4424, 14x4428, 14x4432, 14x4436, 14x4440, 14x4444, 14x4448, 14x4452, 14x4456, 14x4460, 14x4464, 14x4468, 14x4472, 14x4476, 14x4480, 14x4484, 14x4488, 14x4492, 14x4496, 14x4500, 14x4504, 14x4508, 14x4512, 14x4516, 14x4520, 14x4524, 14x4528, 14x4532, 14x4536, 14x4540, 14x4544, 14x4548, 14x4552, 14x4556, 14x4560, 14x4564, 14x4568, 14x4572, 14x4576, 14x4580, 14x4584, 14x4588, 14x4592, 14x4596, 14x4600, 14x4604, 14x4608, 14x4612, 14x4616, 14x4620, 14x4624, 14x4628, 14x4632, 14x4636, 14x4640, 14x4644, 14x4648, 14x4652, 14x4656, 14x4660, 14x4664, 14x4668, 14x4672, 14x4676, 14x4680, 14x4684, 14x4688, 14x4692, 14x4696, 14x4700, 14x4704, 14x4708, 14x4712, 14x4716, 14x4720, 14x4724, 14x4728, 14x4732, 14x4736, 14x4740, 14x4744, 14x4748, 14x4752, 14x4756, 14x4760, 14x4764, 14x4768, 14x4772, 14x4776, 14x4780, 14x4784, 14x4788, 14x4792, 14x4796, 14x4800, 14x4804, 14x4808, 14x4812, 14x4816, 14x4820, 14x4824, 14x4828, 14x4832, 14x4836, 14x4840, 14x4844, 14x4848, 14x4852, 14x4856, 14x4860, 14x4864, 14x4868, 14x4872, 14x4876, 14x4880, 14x4884, 14x4888, 14x4892, 14x4896, 14x4900, 14x4904, 14x4908, 14x4912, 14x4916, 14x4920, 14x4924, 14x4928, 14x4932, 14x4936, 14x4940, 14x4944, 14x4948, 14x4952, 14x4956, 14x4960, 14x4964, 14x4968, 14x4972, 14x4976, 14x4980, 14x4984, 14x4988, 14x4992, 14x4996, 14x5000, 14x5004, 14x5008, 14x5012, 14x5016, 14x5020, 14x5024, 14x5028, 14x5032, 14x5036, 14x5040, 14x5044, 14x5048, 14x5052, 14x5056, 14x5060, 14x5064, 14x5068, 14x5072, 14x5076, 14x5080, 14x5084, 14x5088, 14x5092, 14x5096, 14x5100, 14x5104, 14x5108, 14x5112, 14x5116, 14x5120, 14x5124, 14x5128, 14x5132, 14x5136, 14x5140, 14x5144, 14x5148, 14x5152, 14x5156, 14x5160, 14x5164, 14x5168, 14x5172, 14x5176, 14x5180, 14x5184, 14x5188, 14x5192, 14x5196, 14x5200, 14x5204, 14x5208, 14x5212, 14x5216, 14x5220, 14x5224, 14x5228, 14x523			

Machinery, &c.

THE CHAPIN MACHINE COMPANY,

NEW HARTFORD, CONN.



Double Headed Bolt Cutter.

BOLT MACHINERY,
Double and Single Head Bolt Cutters,
Chapin Header.
Manufacturers of the latest improved
Will cut from 5000 to 10,000 per day.
Will head from 1/4 inch down. Will head 10,000 Bolts per day
Send for Circular.

BUSH HILL IRON WORKS,

Corner 16th & Buttonwood Streets,
PHILADELPHIA.

JAMES MOORE,

(Successor to MATTHEWS & MOORE.)

Engineer, Machinist, Founder and Boilermaker.

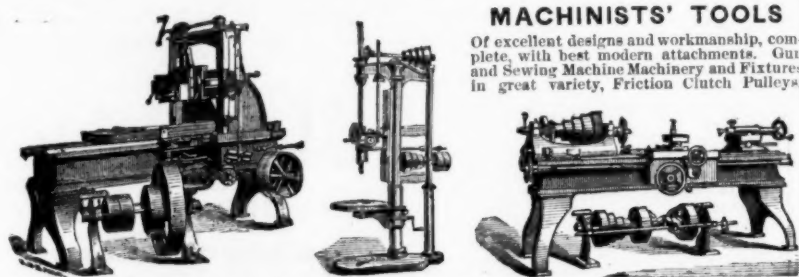
CASTINGS of every description.

ROLLING MILL AND FURNACE EQUIPMENTS COMPLETE.

Rolls Turned for Rails, Beams, Angles, and all shapes for Iron, Steel, or Composition Metals.

Sugar Mill, Saw Mill and Crist Mill Machinery, AND MILLWRIGHTING IN GENERAL.

BOILERS—FLUE, TUBULAR AND CYLINDER, and all kinds of TANK AND PLATE IRON WORK.



Water-Power Organ Blowing Apparatus, Special Machinery, &c., made by
THE PRATT & WHITNEY COMPANY, Hartford, Conn.

MACHINISTS' TOOLS

Of excellent designs and workmanship, complete, with best modern attachments. Gun and Sewing Machine Machinery and Fixtures in great variety, Friction Clutch Pulleys.

Established 1848.

WM. SELLERS & CO.,

1600 Hamilton Street, PHILADELPHIA.,

Engineers, Iron Founders and Machinists.

RAILWAY SHOP EQUIPMENTS.

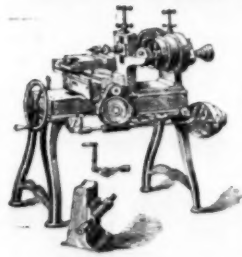
Our Steam Hammers, Lathes, Planers, Drills and Bolt Cutters
Are of Improved and Patented Construction.

Railway Turning and Transfer Tables,
SHAFTING & MILL GEARING, a specialty.

Pivot Bridges.

GIFFARD'S INJECTOR--IMPROVED, SELF-ADJUSTING.

LINCOLN'S MILLING MACHINES.



PHOENIX IRON WORKS.

GEO. S. LINCOLN & CO.

HARTFORD, CONN.

Machinists' Tools,

AND
LINCOLN'S FRICTION CLUTCH PULLEYS.

STEAM ENGINES.

Portable and Stationary. "The Best, Cheapest, most Durable." Improved Circular Saw Mills, Screw and Lever Set. Send for Circular. UTICA STEAM ENGINE CO., Utica, N. Y. G. G. YOUNG, General Agent, 12 Cortlandt Street, New York.

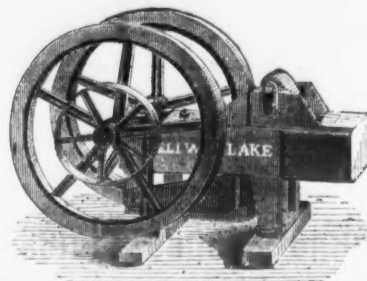
PERSEVERENCE STEAM ENGINE WORKS, Steam Engines and Boilers,

From 2 to 100 horse power, built to order. A supply of second hand Boilers and Engines always on hand.
J. W. WRIGHT, 112 Spruce Street Phila.

Machinery, &c.

IMMENSE SAVING OF LABOR.

BLAKE'S



PATENT

CRUSHING MACHINE

for reducing to fragments (of any required size) all kinds of

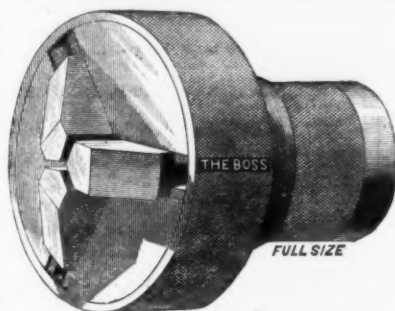
**Hard and Brittle Substances, such as
ROCKS, ORES, MINERALS AND DRUGS.**

For Circulars containing particulars and numerous testimonials, for Price Card, or for other information in the premises, address

BLAKE CRUSHER CO., New Haven, Conn.,

or, E. S. BLAKE, Pittsburgh, Pa.

Persons visiting New York City can see a Crusher in operation by inquiring of B. R. WESTERN, Esq., 37 Park Row, who will give information and prices and receive orders.



Patented Dec. 24th, 1872.

The BOSS Drill Chuck

is warranted to be the best and most perfect made Chuck in use. It holds from 0 to three-eighths inch, and is truly the Boss Chuck. Every piece is made of Forged Steel, and finished to a Gauge. Give it a trial and you will be satisfied; if not, return it at my expense, and your money will be refunded. Address

A. F. Cushman,

Manufacturer of all kinds of Lathe Chucks,
HARTFORD, CONN.

Orders from the trade solicited.

E. C. C. KELLOGG

PATENT.

Feb. 13, 1866.



COMBINATION BELT PUNCH,

Pronounced by those who have used them the handiest and most desirable tool in use of its kind. As will be seen, the combination consists of

Belt Punch, Knife and Awl,

Also, Needle for Lacing Rubber Belting, so combined that each tool does its specific work and not interfere with either of the others.

E. C. C. KELLOGG & CO., Hartford, Conn.

or Sale by Hardware Dealers generally.

THORNE, DeHAVEN & CO.,

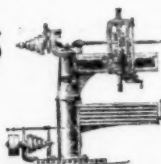
Twenty-first Street, above Market,
PHILADELPHIA.

PATENT

PORTABLE DRILLING MACHINES

PATENT

RADIAL DRILLING MACHINES.



Whitlock's Lifter for Drop and Trip Hammers, Pile Drivers, etc.

Requires less regular power than any other and can be worked as perfectly. Warranted as represented.
For full particulars address

CHAPIN MACHINE CO.,

NEW HARTFORD CONN.

Who also manufacture BOLT CUTTERS and HEADERS.



AMERICAN DREDGING COMPANY.

OFFICE No. 214 SOUTH DELAWARE AVENUE,

PHILADELPHIA.

JOHN SOMERS, PRESIDENT.

F. B. COLTON, SEC'Y & TREAS'R.

Contractors for
River, Harbor and Bank
Improvements,
Steam Dredging Machines,
Steam Tugs, etc.

BACON'S
HOISTING ENGINES

AND

Hoisting Machinery,

Of all descriptions, for

Blast Furnaces, Mines, Docks, Steam-
ships, Contractors' use, &c.,

Safety Hoist Engines,

for Stores and Warehouses.

These Engines are strong, compact, powerful, and
cheaper than anything in the market.

Manufactured by the

Morris County Machine & Iron Co.

36 Cortlandt St., New York,

Works, Dover, N. J.

TAWES & HARTMAN,
ENGINEERS,

1235 and 1237 North Front St., Phila.

Blast Furnaces and Rolling Mills

DESIGNED AND CONSTRUCTED.

Drawings for Machinery made, and Estimates fur-
nished. Special Fittings for Blast Furnaces on
hand and made to order.

Tawes & Hartman's Patent Air Hoist.

AGENTS FOR

KENT'S PATENT HOT BLAST PIPE.

Thomas' Pat. Safety Lift for Bell & Hopper,
prevent explosions. Also,

HOBSON'S PATENT WATER BREAK.

James S. Patterson,
Designer & Engraver
on Wood,

21 Spruce Street, NEW YORK.

Machinery, &c.

ANDREW WATSON,
MACHINIST and ENGINEER,

Nos. 537 & 539 Dickinson Street,
Near Trenton Avenue, 19th Ward, PHILADELPHIA.

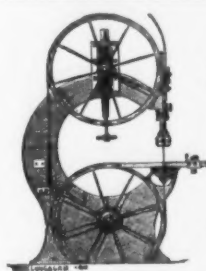
Builder of Vertical Steam Engines and Boilers, peculiar for their economy of space and fuel, safety and quickness in raising steam. Also, sole manufacturer of Improved Balance Governor with automatic stop, Balance Slide Valve, Safety Valves, Stop Valves, Improved Pistons for Engines, which require no setting by the Engineer. Engine Builders and Dealers supplied with Governors, Stop Valves, Safety Valves, &c., &c. These governors are fitted up in the very best manner, with brass Valves and Seats, which will not corrode or stick fast. Guaranteed to regulate under any irregular load which an Engine is subject to. Millwright work executed, and Machinery in general satisfactorily repaired. Engines Indicated Promptly and with the Greatest Accuracy.

EDWIN HARRINGTON,

MANUFACTURER OF

ENGINE LATHES,
AND OTHER MACHINISTS' TOOLS,

Corner of North Fifteenth St. & Pennsylvania Ave., Philadelphia



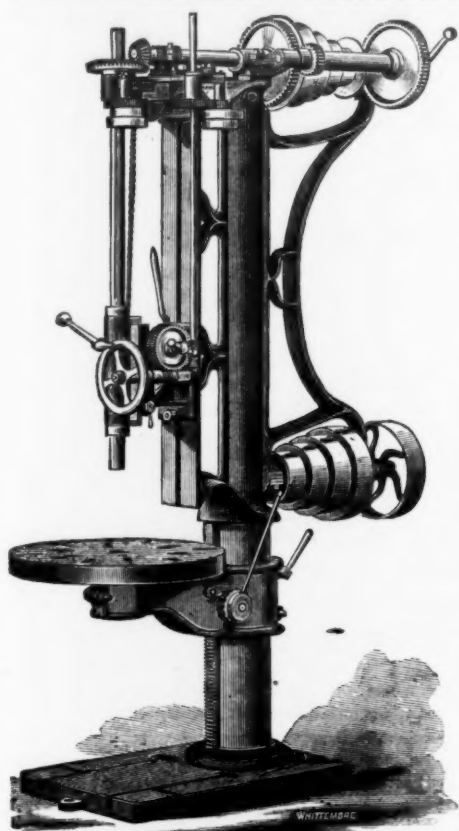
BAND SAW MACHINERY

For Ship & Car Builders, Agricultural, Wagon,
Pattern and Cabinet Shops.

"Perin" French Band Saw Blade

KEPT IN STOCK.

RICHARDS, LONDON & KELLEY,
22nd above Arch, PHILADELPHIA.



P. BLAISDELL & CO.,

Worcester, Mass.,

MANUFACTURERS OF

Engine Lathes & Drill Presses.

RICHARD DUDGEON,

No. 24 Columbia Street, New York,
MAKER AND PATENTEE OF

Hydraulic Jacks and Punches,

ROLLER TUBE EXPANDERS

And Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.

JACKS for Pressing on Car Wheels or CRANK PINS made to order.

The Bessemer Steel Works,
of John A. Griswold & Co.

Troy, N. Y., May 3, 1872.

B. F. Sturtevant, Boston, Mass.,

Dear Sir,—We have changed your No. 8 for
your No. 9. Pressure Blower. The time
in melting is about the same with either Blower.
We are melting 225,000 lbs. (112½ tons.)
Pig Iron daily, (20 hours running time.)
It works well.

BARNEY MEE, Supt.

New York Steam Engine Co.,

MANUFACTURERS OF

Engine Lathes, Planers, Bolt Cutters, Upright Drills

AND

MACHINISTS' TOOLS

OF ALL DESCRIPTIONS.

Office and Wareroom, 121 Chambers and 103 Reade Sts., New York.

WORKS AT PASSAIC, NEW JERSEY, WITHIN 11 MILES OF NEW YORK CITY.

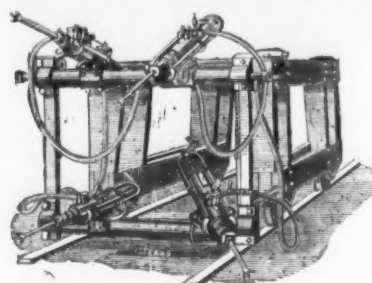
GEORGE PLACE, Pres't

JOHN H. CHEEVER, Treas.

CHAS F. HARDWICK, Sec'y.

Machinery, &c.

THE BURLEIGH ROCK DRILLS
AND
AIR COMPRESSORS



are pronounced by the most eminent engineers in the country as a necessity for the practical working
of all Mines, Tunnels, Quarries, &c. The above machinery is the only machinery that has ever done
any successful Tunnel work in America. (They are to be used on the St. Gothard Tunnel, Switzerland,
Tunnel 13 miles long.) We refer to the following eminent engineers and works:
Gen. Newton, U. S. A. Hell Gate Tunnel, L. I.
Mess. Shanley. Hoosac Tunnel, Mass.
J. Dutton Steele. Nesquehoning Tunnel, Pa.
Stacey Dillon. Fourth Avenue Work, N. Y.
Col. Hoebbing. East River Bridge Company, N. Y.

Send for Illustrated Pamphlet to
Burleigh Rock Drill Company,
FITCHBURGH, MASS.

FERRIS & MILES,

24th & WOOD STS.,

(Take Arch or Race & Vine Street Cars.)

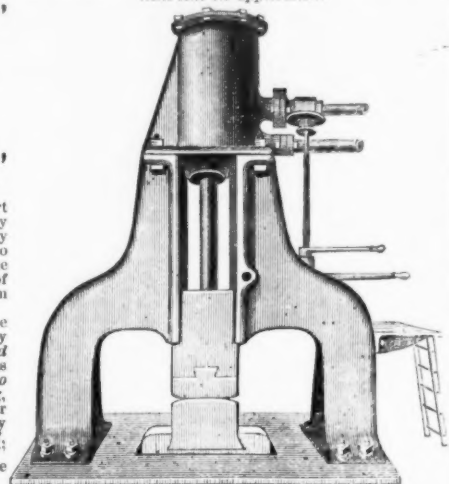
PHILADELPHIA.

Steam Hammers, Drops, Etc.,

With our latest Improvements.

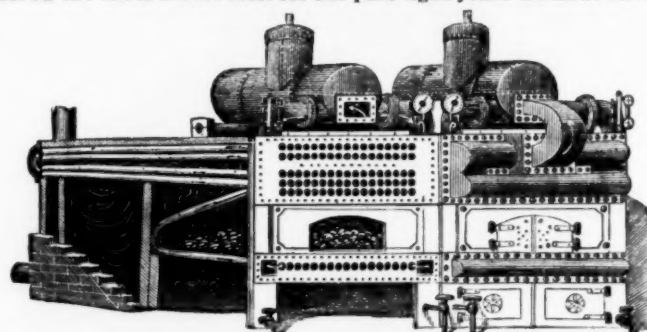
60 different styles and sizes, extra long or short
stroke, from 100 lbs. upward, suited to every
kind of work in Iron and Steel. The heavy
Ram, guided in broad bearings close down to
its work, produces the greatest effect with the
least expenditure of steam, ensures accuracy of
Die work, and saves piston and cylinder from
the shock of impact.
Our patent balanced valve gear of but three
moving pieces, takes up its lost motion by
gravity. It reduces to a minimum, the required
steam power, friction, wear and repair. Boys
of 12 easily in range it by a single lever with no
extra gear; strike dead or elastic blows, long,
short, light, quick, slow, heavy, by hand or
automatic, at will. The hammer-man, also, by
our New Patent Treadle, can work it himself,
with his foot, and stop or start "on the blow,"
the hammer always stopping up, ready to strike
again.

Photographs, Prices, Foundation Drawings, and full descrip-
tions sent on application.



THESE BOILERS

Have stood the most severe tests for the past eight years without an accident.



SAFETY STEAM BOILER MFG. CO.,

THOMAS VERNER, Proprietor,

MANUFACTURER OF

Non-Explosive Boilers, Steam House Heaters, Engines & General Machine Work

These Boilers are safe from explosion: are very durable and economical, both in fuel and repairs.
They have few joints or connections, and none of these is fire surface, perfectly free expansion; the cir-
culation of water through the tubes keeps them perfectly clear of scale and sediment.

WORKS: 30th and Chestnut Streets, PHILADELPHIA.

Morse Twist Drill and Machine Company,
New Bedford, Mass.,

SOLE MANUFACTURERS OF

MORSE PATENT STRAIGHT-LIP INCREASE TWIST DRILL.



BEACH'S PATENT SELF-CENTERING CHUCK.

ALSO MANUFACTURE

SOLID AND SHELL REAMERS.

All Tools exact to Whitworth's Standard Gauge.

DRILLS MADE TO FIT ANY SOCKET DESIRED.

EDWARD S. TABER, Treasurer.

UPRIGHT BALANCE ENGINE

AND

Kindling Wood Splitters

Also, all kinds of

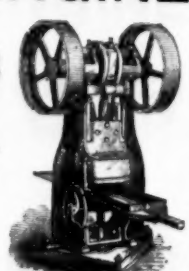
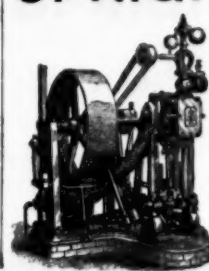
Kindling Wood Machinery, &c., &c.

For Illustrated Price List and Circular, address

D. A. GREENE,

326 & 328 Delancey Street,

NEW YORK CITY



Machinery, &c.

WESTON'S
PATENT DIFFERENTIAL
Pulley Blocks,

Warranted superior to any made

RATCHET DRILLS,

Machine Finished, Case Hardened and
Interchangeable.

HOOKHAM'S PATENT STEEL

Ribbon Sash Line,

Working qualities superior, decidedly stronger and
carefully lacquered, and will remain so.

VAN WART & MCCOY,

Sole Agents,

43 Chambers Street, New York.

VOLNEY W. MASON & CO.,

Manufacturers of patent

FRICTION PULLEYS,

Friction Clutches for connecting Shafting & Gearing

Hoisting Machinery for Elevators

Mines, Quarries, Pork Packing Houses

Abattoirs, Warehouses, etc.

SHAFTING, HANGING and GEARING

PROVIDEN E. R. I.

JAMES HENSHALL,

Engineer, Machinist & Blacksmith
1036 Bench St., PHILADELPHIA.

Drawings made to order. Repairing of all kinds
promptly attended to. Blacksmithing executed in
all its branches.

Frederic Fuller,

Manufacturer of

COMPOSITION ROLLS

For Paper Machinery and Calenders. Also,

Church and Factory Bells and

Brass and Bronze Castings

of every description.

438 S. Main St., PROVIDENCE, R. I.



IMPROVED GAGE COCKS.
Simple, Durable and Efficient.



Automatic Damper Regulator,
FOR STEAM BOILERS.

SAFETY, ECONOMY & DURABILITY
MURRILL & KEIZER, Baltimore.
Agents Wanted. Send for Circulars.

HENRY BLUNDELL & CO.,

MACHINISTS,

And Manufacturers of

JEWELERS' TOOLS

of every description.

BRASS FOUNDERS & FINISHERS.

Barry's Steam Cylinder Packing

PATENTED JUNE, 1872.

LITTLE'S PATENT CART HOIST.

For State Rights, and Rights to manufacture, or further
information, address

Nos. 98 to 106 Orange, & 63 to 69 Peck Sts.

PROVIDENCE, R. I.

Price List sent free on application.

PUNCHING
PRESSES.

For the Best and
Cheapest, and
dress THE STILES
& PARKER PRESS

MIDDLETOWN, CONN.

SAFETY GOVERNOR "ACME."

Superior to all others, because the valve is steam
balanced and larger; will bear greater changes of
pressure of steam, and run the engine smoother and
more regular during changes of load. All trials at
manufacturer's risk. Circulars free. Address

J. D. LYNDE, Patentec,

405 N. 8th Street, Philadelphia, Pa

American Chain Cable Works,

28 Years' Experience in the Business.

KENDRICK & RUNKLE, Trenton, N. J.,

Manufacturers of Cable, Crane, Coal Mine,
Slope, Car Brake Chains, Traces, Breast,
Binding, Cow and Log Chains of all kinds.
N. B.—The highest grades of Crane Chains a spe-
cialty.

Burnet & Leonard,
Steam Boiler Manuf'rs,

2d Wharf above Bridge St., Newark, N. J.

Vertical Boilers, 4 to 30 Horse Power, constantly
on hand.

TUBAL SMELTING WORKS, DUPLAINE & REEVES, MANUFACTURERS OF ANTI-FRICTION METALS

OF VARIOUS GRADES.

XXX Metal Nickel Hardening.....55 cts. 1/2 lb.	D These metals are alloys of lead, with	25 cts.
XX Metal Nickel Hardening.....50 cts. 1/2 lb.	E a large percentage of tin, antimony	20 cts.
X Metal Copper Hardening.....45 cts. 1/2 lb.	F (and copper, according to price.	18 cts.
B " " ".....35 cts. 1/2 lb.	G These metals are the ordinary low	16 cts.
C " " ".....30 cts. 1/2 lb.	H priced Babbitt alloys, used where	14 cts.
	I there is not much wear on the ma-	12 cts.
	J chinery, and where economy is re-	
	quired.	

BRASS CASTINGS

Of all qualities of metals, 28 to 45 cts. 1/2 lb. Pig Brass, 23, 25, 28, 31, 36, cts. 1/2 lb. Importers of Block Tin, Lead, Antimony, Spelter, Crucibles, etc.

J. E. HALSEY, Agent for New York,

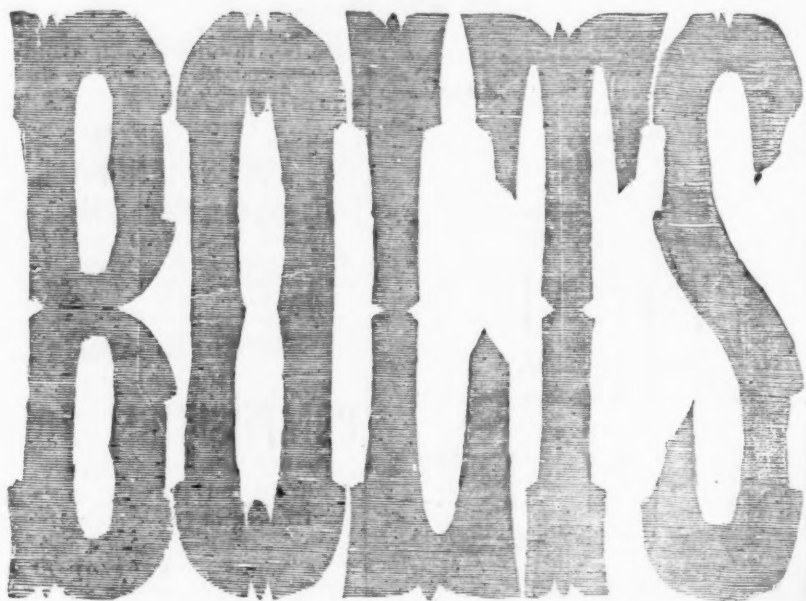
P. O. Box 4140.

76 Reade St., N. Y.

Plumb, Burdict & Barnard,

BUFFALO, N. Y.

MANUFACTURERS OF



COACH SCREWS,

SKEIN BOLTS,

PATENT

Diamond Neck Carriage Bolts,

TIRE, SLEIGH SHOE,

Machine and Blank Bolts.

FERNALD & SISE, N. Y. Agents, 31 Beekman St.

AUSABLE HORSE NAIL CO.,

MANUFACTURERS OF

SUPERIOR HAMMERED HORSE NAILS.

FROM

BEST NORWAY IRON.

ORDERS PROMPTLY FILLED AT LOWEST MARKET RATES.

ABRAHAM BUSSING, Secretary,

35 Chambers Street, NEW YORK

N. B.—Beware of imitations. No machines the same as ours are in operation in the United States east the Alleghany mountains

GLOBE NAIL COMPANY,

MANUFACTURERS OF

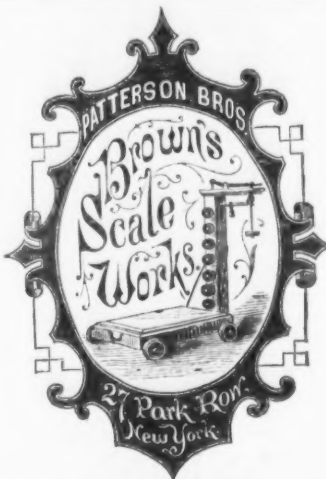
Pointed, Polished & Finished Horse Shoe Nails.

Recommended by over 20,000 Horse Shoers.

All Nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by

GLOBE NAIL CO., Boston, Mass.

**Seiple, Birge
and Co.**
HARDWARE SPECIALTIES
((AND))
AGRICULTURAL TOOLS
ST. LOUIS, MO.



CORDAGE, ROPE, etc.
D. ALLEN'S SONS MFG. CO.

136 Front Street, New York.

**Manila and Sisal Cordage,
JUTE ROPE.**

Send for Price List.



OILERS! OILERS!

J. H. WHITE, Newark, N. J.,

MANUFACTURER OF

Olmsted Patent and Common Oilers,

of all descriptions.

Colwell Patent Door Spring Children's Carriage Trimmings, Spun and Stamped Brass for all Trades, Dies and Tools, &c., &c.

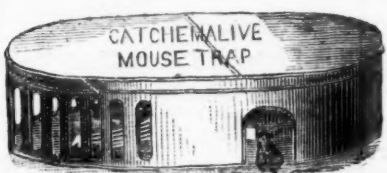
Wm. & Harvey Rowland,

Manufacturers of

NORWAY SHAPES,

Springs and Steel,

No. 948 Beach St., Philadelphia.



DON'T READ THIS!

BECAUSE

Each mouse caught resets the Trap for another!

A

**Fruit Jar
WRENCH**

That every house-keeper will not be without after one trial!



The

**Celebrated
TUBULAR**

AND OTHER

LANTERNS.

Brass and Iron

Jack Chain.



For sale by all the trade.

R. E. DIETZ,

Patentee and Manufacturer,

54 & 56 Fulton, and

29 & 31 CHURCH ST., NEW YORK.



Established 1827.

Dixon's Stove Polish; Dixon's Black Lead Crucibles; Dixon's Lubricating Plumbago; Dixon's Plumbago, all kinds, for all uses;

Dixon's Lumber Pencils.

After 8 Years of Preparation,

Dixon's American Polygrade Pencils.

A Special Stamp on all of our Pencils will be a Skeleton Crucible. There will be no numbers to denote the grades, but letters instead, as follows:
S. "SOFT."—For heavy black marks, or for directing parcels. Too soft for the pocket or general use.
M. "MEDIUM."—For general commercial or pocket use. The most popular grade.
H. "HARD."—For Civil Engineers, Architects, Draughtsmen, &c. A smooth, fine Pencil that holds its point well.
V. H. "VERY HARD."—For the finest lines, equal to a steel graver.

Samples Free by Mail. Address

The Joseph Dixon Crucible Company,
JERSEY CITY, N. J.

**BLACK LEAD
CRUCIBLES.**

TAYLOR, STROW & CO.,

The Largest Manufacturers of Black Lead Crucibles

in the United States.

All sizes constantly on hand for melting Steel, Brass and other metals. Also any size or shape made Chemical Assaying and Refining purposes. All our Crucibles are warranted.

1330, 1332 & 1334 Callowhill Street, PHILADELPHIA.

**PENNSYLVANIA
CRUCIBLE WORKS.**

ROSS, STROW & HOFERKAMP,

1438, 1440, 1442 & 1444 North Sixth Street,

PHILADELPHIA, PA.,

MANUFACTURERS OF

BLACK LEAD CRUCIBLES.

Warranted equal to any in the market, and sold in quantities to suit purchasers.

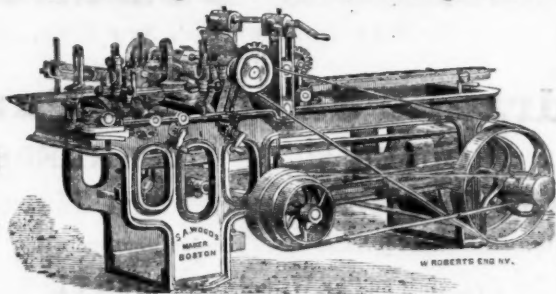
S. A. WOODS MACHINE CO.,

Manufacturers of all kinds of

WOOD WORKING MACHINERY,

And Iron Tools, Steam Engines & Boilers, Shafting, Pulleys & Hangers.

ALSO,
SOLID
EMERY
WHEELS
AND
GRINDING
Machines.



**PLANER
KNIVES**
to fit any machines.

**MOULDING
Cutters**
made to order.

Send for Circulars and Price List.

Machinery Depots, 91 Liberty Street, N. Y.

67 Sudbury Street, Boston, Mass.

**THE IVENS & BROOKE PATENT
ECCENTRIC GEARED
POWER PRESS**

For Punching, Shearing, and Stamping Metals.

Irregular motion of Crank-Shaft corrected by Eccentric Gear.

Saves 50 per Cent.

In wear of Dies and Punches and time lost in changing them. At same speed with the old Press, this gives double the time to adjust the work, insuring accuracy and greater production.

The Patent Adjustment warranted Positive under all pressures, and susceptible of the nicest shade of variation.

MANUFACTURED BY

AMERICAN SAW CO.,

No. 1 FERRY STREET, N. Y.

FACTORY, TRENTON, N. J.

Send for Descriptive Circular.



JOHN TOLER, SONS & CO.

MANUFACTURERS OF

FURNITURE CASTERS.

We make the greatest variety of any house in the States. We combine ourselves exclusively to their manufacture, and guarantee the quality. We solicit only the best, so when we are prepared to give the best prices.

ESTABLISHED IN 1841.

105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599, 601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689, 691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719, 721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749, 751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809, 811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839, 841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869, 871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899, 901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991, 993, 995, 997, 999.

Sole manufacturers of Ford's Celebrated Patent Casters.

GAUGES

FOR

Steam, Air, Gas, Vacuum, Locomotive and other uses. Engine Counters, &c., &c.

The Recording Steam Gauge Co.,

91 Liberty St., New York.